Report of the
Information Technology Management
Steering Committee

Agricultural Research Service

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Introduction

This is the report of the ARS Information Technology Management Steering Committee. The ITMSC was chartered by the ARS Administrator to assess how well ARS was managing its information technology resources and to take steps to improve those management practices and to meet Congressional and Departmental requirements. See attachment J for the steering committee charter and membership.

ARS is uniquely responsible for creating new knowledge and the data, information, and technology necessary for a sustainable and globally competitive American agriculture. The knowledge produced by ARS is a strategic national resource for American agriculture and the Nation. The ARS core business areas are:

- Research
- Business Operations
- Library and Information Services
- Information Dissemination and Public Awareness

Background

GAO Best Practices

In May 1994, the General Accounting Office published a report, *Improving Mission Performance Through Strategic Information Management and Technology*, on information technology management practices that led to performance improvements in some of the best private and public sector organizations. See attachment I for a list of these 11 best practices.

Clinger-Cohen Act

Congress incorporated GAO's best practices into the Information Technology Management Reform Act, or Clinger-Cohen Act, which went into effect August 8, 1996. Clinger-Cohen focused on results-based management of IT investments and required cabinet departments to establish a Chief Information Officer (CIO) to coordinate IT issues. It encouraged, but did not require, CIOs at the sub-cabinet level.

USDA CIO Requirements

USDA has required agencies to establish an Information Technology Investment Review Board to increase program manager involvement in IT decisionmaking and has also encouraged USDA agencies to establish their own CIOs.

ARS Information Technology Management Steering Committee

In April 1997, the Information Technology Management Steering Committee assessed ARS's management of information technology resources using a self-assessment tool based on GAO's best practices. The review found that ARS was relatively strong at strategic planning and obtaining customer input, but weak in terms of IT organization structure, management of IT projects as investments, and information architecture. Attachment K contains a summary of the self-assessment process and results.

Based on the self-assessment, the ITM Steering Committee recommended the establishment of three action teams. Ultimately, three more teams were added for a total of six. The teams were chartered in October 1997 (see attachment L for charters) and began work late that calendar year. The full text of the six team reports are included as attachments A through F.

Recommendations

The Information Technology Management Steering Committee endorses the six action team reports and supports implementation of all recommendations in those reports. However, certain recommendations are key to the success of this effort and the steering committee believes that these recommendations should receive priority attention. These key recommendations are:

IT Leadership and Direction

1. **Adopt and begin implementing the Information Technology Management Strategic Plan.** (Team 1, attachment A)

The Information Technology Management Strategic Plan provides a road map for improving use of information technology to deliver first-class science to ARS customers. This strategic plan is the umbrella plan that incorporates all the recommendations from the ITMSC action team reports. The steering committee recommends that this plan be adopted and that implementation begin under the auspices of the proposed Chief Information Officer and the transition team (see recommendation 3 below).

2. Adopt methods to ensure that the ARS mission drives its information systems and the deployment of information technology. (Teams 1 and 3, attachments A and C)

The vision of the Information Technology Management Strategic Plan is that ARS information systems will be mission-driven, integrated, based on shared databases, and responsive to customer needs. Effective information systems must flow from mission requirements. To ensure that this happens on a regular basis, the ITMSC recommends adopting a set of structured analytical processes to identify the information needs of ARS customers (both internal and external), review existing core business processes, and determine information systems requirements.

3. Establish a Chief Information Officer for ARS. (Teams 1, 2, and 3, attachments A, B, and C)

The steering committee recommends creation of a CIO position, with an effective organizational framework, as critical for building an ARS-wide information management capability responsive to customer needs. The CIO should report to the Administrator, set ARS-wide IT policy, serve as the Year 2000 Executive Sponsor, and focus attention on using information technology to deliver science to ARS customers. Candidates for the CIO position should have demonstrated leadership in science and technology as well as expertise in information technology.

Attachment G contains a description of the proposed duties and reporting relationships of the CIO. Further work needs to be done to define the role and authority of the CIO, including appropriate staffing and a source of funding. The ITMSC recommends establishing a transition team to complete this definition and to provide interim implementation guidance while action is taken to recruit and fill the CIO position and associated staff. Attachment H contains the proposed membership and duties of this transition team.

4. Establish an ARS Information Technology Investment Review Board (ITIRB). (Teams 1, 2, and 3, attachments A ,B, and C)

The USDA Chief Information Officer has required USDA agencies to establish an ITIRB to oversee IT investments. The ARS ITIRB will approve new information technology investments and evaluate existing projects and operational systems. It will focus on creating an ARS Information Technology investment portfolio that supports the Agency mission and program delivery processes. The proposed ITIRB will be chaired by the Associate Administrator and include the Deputy Administrators of NPS and AFM; the Director, Budget and Program Management Staff; the NAL Director; one Area Director selected by the Administrator; and the Chief Information Officer (as nonvoting Executive Secretary). The proposed charter, board membership, and operating policies and procedures are described in attachment B.

Research Support

5. Develop a process by which decision support systems and other information-based products are developed, placed, and supported in an information system. (Team 1, attachment A)

There is increasing demand to develop and provide ongoing support for decision-support systems and other information-based products that meet the needs of ARS customers. Currently, there are no standard processes, platforms, and data base models for developing such information products and no procedures for continued maintenance of those products once developed. The ITMSC recommends establishment of rapid prototype pilot project(s), such as the Rangeland Health Assessment Expert System, to provide a way for defining such standard approaches. The pilot project(s) would be the basis to develop and maintain future expert systems and decision tools that enhance technology transfer of ARS research results to users and the public. At the same time, the steering committee recommends appointment of a small team of field and NPS scientists, NAL, top-level management, and the Office of Technology Transfer (OTT) to develop a policy statement that will encourage identification of customer needs for such systems, support their development, and begin the process of defining standards and procedures for increased sharing and utilization of user models, expert systems, decision tools, and data bases.

6. Procure or develop a program management system to replace the current RMIS and other systems. (Team 4, attachment D)

Action Team #4 has completed a model of the program and project management processes used in ARS and has developed the basic requirements for designing new systems to support these processes. These new systems would replace RMIS, ARMPS, the Budget Allocation System, and others. The recommended next steps would be to:

- Implement new processes developed.

- Complete process improvement projects and models for the Peer Review Process, National Program Evaluation and Modification, Research Agreements Planning and Management, and National Program Team formation and make-up.

- Survey commercial or other available software to see if there is any that can be adopted or modified for use in ARS. If no such system exists, we would proceed with the systems development process.

Estimated first year costs include $143,000 in contracts and use of in-house staff with salaries totaling $139,000. This covers the process-improvement and model activities, the commercial

survey, staff training, and the planning and investment analysis. Development costs in year 2 amount to $150,000 in contract costs plus use of in-house staff with salaries totaling over $480,000.

7. Enhance access to scientific information for ARS researchers. (Team 6, attachment F)

Through the CALS service, NAL currently provides scientific information to ARS researchers using Knight Ridder's Dialog Alerts service. This contract service costs about $800,000 per year. Individual ARS locations spend another $160,000 per year to subscribe to the Current Contents Connect data base service. The ITMSC recommends replacing the Knight Ridder service with the Current Contents on CD database and also providing a central license for all ARS scientists to use Current Contents Connect for direct searches. Implementing this recommendation will save a significant portion of the existing costs.

External Communications

8. Improve the utility of ARS websites and other electronic media to provide broader distribution and easier access to agricultural information. (Team 1, attachment A)

The ITMSC recommends improving the utility of ARS websites through more coordinated access to the agricultural information that is available on them. The ARS webmaster, working with the ARS Web Board, should issue policies, procedures, and guidelines for development, maintenance, and coordination of ARS websites. This would include development of indexes and linkages to ARS and other agriculturally related information resources. Transferring the ARS webmaster function to the proposed Chief Information Officer (see recommendation 3) will help to implement this recommendation.

9. Develop an information/communication strategy. (Teams 1 and 5, attachments A and E)

Implement an integrated, Internet-based communications process for improving access to information on ARS's National Programs, research activities, and accomplishments by internal and external users and customers. This process is to include descriptions of the national program structure, lists of hot topics, expert contacts, a section with responses to frequently asked questions, and easy electronic update capabilities. As an initial step, a structured analysis of existing agency information management organizations, methods, and techniques is recommended to determine what now works well and what activities/resources need to be redirected to accomplish this goal.

Infrastructure To Sustain Improvements

10. Develop integrated information systems to support core business areas. (Teams 1 and 4, attachments A and D)

The work done to define requirements for a new program management system serves as the foundation for future integrated systems development in ARS. These requirements were developed using structured analytical techniques and depend on use of shared data bases and common computing platforms. Use of these techniques and approaches corresponds with objectives in the Information Technology Management Strategic Plan. This information systems development method needs to be coupled with efforts to establish ARS-wide connectivity via the Internet and the USDA Telecommunications Enterprise Network (TEN) and provide adequate levels of IT security and protection.

11. Ensure that managers, users, and technical staff acquire and maintain information technology competencies. (Teams 1 and 3, attachments A and C)

Effective management and use of information technology resources requires that ARS staff have the requisite skills. The skills required will differ for managers, scientists, support staff, and technical computer staff. The ITMSC recommends that ARS assess the capabilities of existing staff in different categories, define benchmarks that employees in those categories should meet, and then develop and implement training plans for each user group.

12. Preserve our agricultural heritage for future generations by implementing a process for preservation of and access to USDA documents in electronic form. (Team 1, attachment A)

With the continued expansion in use of electronic documents to deliver information to the agricultural community, the risk grows that we will lose access to certain documents forever. The ITMSC recommends that ARS develop and implement appropriate standards, policies, and procedures to ensure long-term preservation of agricultural information published in electronic form and that such information is continuously accessible into the future.

Attachment A

USDA-ARS

Information Technology Management

Strategic Plan

By the

Information Technology Management,
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Executive Summary

The Information Strategy Plan (ISP) is the result of a strategic information systems planning process. It provides goals, objectives, and strategies to support ARS's core business areas and customers. The ISP should be viewed as a living document and updated periodically to reflect changes in technology, organization, infrastructure, and program. It is a high-level assessment and overview of the business architecture, its requirements, functions, and processes from an information perspective. This planning is the framework for developing integrated information systems and technology through further definition and specification of architecture components and information elements. This ISP addresses the information needs of ARS functions including program operations.

Recommendations

Organization:

1. **The ARS mission drives its information systems and the deployment of information technology.** (Goal 1)

- Identify ARS's internal/external customer information needs, and
- Select core business areas for which business area analyses (BAA's) will be conducted to determine their information systems requirements.

2. **Develop top level management commitment to Information Technology.** (Goal 2, Objective 3, Strategy 1; ITM Team # 3 Report)

- Adopt and implement the ISP and its recommendations.
- Use the Administrators Council to motivate and encourage management to support IT development.
- Provide resources for implementation of IT.

3. **Establish a Chief Information Officer position reporting to the Administrator.** (Goal 2, Objective 1; ITM Team #3 Report)

- Define the role and authority of the CIO, including appropriate staffing level for the CIO's office and a source of funding.
- Establish a transition team to provide interim implementation guidance.
- Recruit and fill the CIO position and associated staff.
- Disseminate the governing policy to all ARS offices.

4. **Establish an ARS IT Investment Review Board (ITIRB).** (Goal 2, Objective 2, Strategy 1; ITM Team #2 Report)

- Adopt the charter and appoint members of the board.
- Develop policies and procedures.
- Disseminate the governing policy to all ARS offices.

Infrastructure:

5. **Develop integrated information systems to support core business areas.** (Goal 2, Objectives 4, 5, and 6; ITM Team # 4 Report)

- Implement proposed actions for the redesign of program and resource management processes and systems including resource management information systems (RMIS).
- ! Conduct business area analyses as a foundation for design and implementation of IT systems on selected business areas.
- Design and implement on a common technology platform shared data/information systems that include necessary levels of IT security and protection.
- Establish database connectivity and accessability via Internet/Telecommunications Enterprise Network (TEN) for all ARS locations.

6. **Assess the current capability of existing staff and identify training needs and then establish benchmarks for various competency levels for managers, users, and technical staff.** (Goal 3, Objective 1, Strategy 1)

- Establish training needs for different groups of users.
- Develop and implement training plans for each user group.

7. **Improve and the utility of ARS web sites and other electronic media to provide broader distribution and easier access to agricultural information.** (Goal 5, Objective 3, Strategy 1)

- Establish policies and procedures for the development and maintenance of ARS Web sites.
- Provide an index and linkages to ARS and other agriculturally related information resources.

8. **Develop an information/communication strategy.** (Goal 5, Objective 1, Strategy 1; Objective 2, Strategy 3; ITM Team # 5 Report)

- Conduct Business Area Analysis on the information communication area to set policies and guidance on what information is to be shared internally and/or externally.
- ! Implement an integrated communication process whereby access to information related to ARS research activities will be made more accessible on a continuing basis.
- Ensure access to ARS National Programs by continuously updating national program

information and making it available electronically.

- Expand information resources through development of lists of research experts, hot topics, and frequently asked questions.

9. Determine the most efficient, cost effective and flexible electronic media to deliver CALS. (Goal 5, Objective 2, Strategy 1; ITM Team # 6 Report)

! Adopt the recommendations for CALS made by ITM Team #6.

Program:

10. Develop an ARS policy to support the development and publication of user-models, expert systems, decision tools and data bases. (Goal 4, Objective 2, Strategy 1)

- Appoint a small team including scientists (field and NPS), NAL, top level management, and the Office of Technology Transfer (OTT).

11. Develop a process by which decision support systems and other information based products are developed, placed, and supported in an information system. (Goal 4, Objective 2, Strategy 2 and 3)

- Develop and implement rapid prototype pilot project(s) such as the Rangeland Health Assessment Expert System.
- Use the Pilot project(s) as a basis to develop future expert systems and decision tools which enhance technology transfer of ARS research results to users and public.
- Use pilot projects to ensure that IT will support data bases and research findings necessary to build decision support systems for technology transfer.

12. Preserve our agricultural heritage for future generations by implementing a process for the preservation of and access to USDA documents in electronic form. (Goal 5, Objective 5, Strategy 2)

- Develop and implement appropriate standards, policies and procedures to ensure the long term preservation of agricultural information published in electronic form.
- Ensure that information is continuously accessible into the future.

USDA-ARS

Information Technology Management Strategic Plan

1998

ARS MISSION. As the principal in-house research arm of the U.S. Department of Agriculture, the Agricultural Research Service has a mission to:

> Conduct research to develop and transfer solutions to agricultural problems of high national priority and provide information access and dissemination to: ensure high-quality, safe food and other agricultural products, assess the nutritional needs of Americans, sustain a competitive agricultural economy, enhance the natural resource base and the environment, and provide economic opportunities for rural citizens, communities, and society as a whole.

ARS CORE BUSINESS AREAS. ARS is uniquely responsible for creating new knowledge and the data, information, and technology necessary for a sustainable and globally competitive American agriculture. The knowledge produced by ARS is a strategic national resource for American agriculture and the Nation.

Research

- Program planning and priority setting
- Knowledge development & transfer
- Technology development and transfer

Business operations

- Administrative management
- Budget and Finance
- Resource management
- Information technology
- Purchasing and Contracting
- Grants and Agreements

Library & Information Services

Information Dissemination & Public Awareness

ARS VISION. ARS must fully use information technology to develop and maintain our mission-based information systems and improve customer access to and use of research knowledge. Therefore, the Agricultural Research Service has established the following vision.

> **ARS information systems will be mission driven, integrated, based on shared databases, and responsive to customer needs.**

PURPOSE OF THE ISP. The ARS Information Strategic Plan (ISP) provides a framework within which strategic information systems, information technology goals, objectives and performance measures can be implemented. This framework calls for the prioritization, analysis, and improvement of ARS' core research and business area processes including detailed business area analyses (BAA), structured design, and disciplined implementation. In taking this approach, ARS will be better positioned to accomplish its research mission and meet its customer's needs through effective and efficient use of information technology (IT).

This ISP responds to the requirements of the following:

1. Information Technology Management Reform Act (The Clinger-Cohen Act of 1996),
2. Information Technology Management Guidelines of the USDA Office of the Chief Information Officer,
3. The Government Performance and Results Act (GPRA),
4. The General Accounting Office (GAO) IT management recommendations, and
5. The GAO's Best Practices for improving IT performance and results.

Specifically, the Information Technology Management Reform Act requires that major information system and IT decisions be based on performance-based, results-oriented management decisions. The ISP responds to those needs and supports the:

1. USDA's Strategic Plan - 1997-2002,
2. Draft USDA IRM Strategic Plan,
3. REE Information Strategy Plan, and
4. REE and ARS strategic plans.

BENEFIT. ARS information systems and their application to the creation of scientific knowledge must be a continuing core process as an integral part of the ARS Strategic Plan. ARS information systems will be developed using information engineering (IE) methods, customer input, and mission driven information systems priorities. Through implementation of this plan, data reliability will be increased through one-time data entry to data bases accessible to all parts of the ARS research community. The IT Investment Review Board will assist senior management in optimizing ARS resource allocation for IT and information systems development.

It should be noted that as a result of the 1995 REE ISP and in response to the IT requirements listed above, ARS has already implemented several short-term improvements recommended by action teams linked to the purposes of this ISP. These include:

Action Team 1.	Prepare an Information Strategic Plan (ISP) for ARS
Action Team 2.	Establish an ARS IT Investment Review Board
Action Team 3.	Strengthen management involvement with IT
Action Team 4.	Redesign program and resource management processes and systems including the Resource Management Information System (RMIS)
Action Team 5.	Develop an Information Communication Strategy for National Programs
Action Team 6.	Identify research information needs of ARS researchers

Additional recommendations of these teams will become part of the current ISP as process improvement initiatives in the future. The ISP will be a living document incorporating the principles of continual process improvement which will move ARS toward realization of its IT vision within available resources. The specific goals and objectives required for this ISP are listed below.

GOAL 1: The ARS Mission drives its information systems and the deployment of information technology.

Rationale: The focus of this goal is development of a comprehensive overview of the ARS information systems needed to support in the Agency's mission, and meet the needs of ARS customers. ARS needs a clear understanding of its own policy making methods, decision processes, workflow processes, and input and output processes. This picture is to include an understanding of the linkage and interaction of the ARS information systems with others in REE and USDA and with external information systems used by customers.

Objective 1: Identify ARS information needs.

Strategy 1: Identify customers information/knowledge needs.

Strategy 2: Prioritize customer information needs.

Objective 2: Ensure that information systems support the Agency mission.

Strategy 1: Identify core program business areas.

Strategy 2: Identify information system needs for the core ARS business and program areas. (Action Team 6)

Strategy 3: Prioritize information system needs for core business areas.

GOAL 2: ARS information systems are reliable, secure, relevant, innovative, well planned, and effectively managed.

Rationale: The focus of this goal is to ensure effective development and management of information systems that enable ARS to substantially improve management of its business affairs, strengthen its research programs, and provide American agriculture with science-based information and tools when and where they are needed. Management of wide-ranging, multi-location, multi-disciplinary, multi-customer agricultural research programs, their interactions with partners, and the resources that support them is information intensive. For its internal operations as well as serving its customers, the effectiveness, economy, timeliness, relevance, and integrity of information storage and retrieval is important to the Department and its agencies.

Objective 1: Establish a Chief Information Officer (CIO) position reporting to the Agency Administrator.

Strategy 1: Define the role and authority of the CIO office.

Strategy 2: Establish a transition team to provide interim implementation guidance.

Strategy 3: Recruit and fill the CIO position and associated staff.

Strategy 4: Disseminate the governing policy to all ARS.

Objective 2: Establish an ARS IT Investment Review Board (ITIRB) (Action Team 2).

Strategy 1: Define the role and authority of the ITIRB consistent with departmental policy.

Strategy 2: Appoint the ITIRB, give it its charge and disseminate the governing policy to all ARS.

Objective 3: Strengthen management involvement with IT (Action Team 3).

Strategy 1: Develop top level management commitment to IT.

Strategy 2: Ensure management's knowledge and understanding of the value of IT.

Objective 4: Apply a disciplined systems analysis (such as information engineering (IE) methods) to the design and implementation of information systems that support priority core program and business areas.

Strategy 1: Conduct analysis of selected business functions. Business area analyses are finished for REE human resources (HR) and budget; finance, and accounting (BFA). An analysis is in progress for RMIS (Action Team 4).

Strategy 2: Design, program, test and implement information systems for selected business functions and related databases.

Objective 5: Develop information processes and systems that protect mission-critical and sensitive information.

Strategy 1 Identify on an ongoing basis the need for IT security and the associated risk.

Strategy 2 Identify the mission and business related needs that justify limited access to sensitive information.

Strategy 3 Implement security policy and measures to protect information resources that are commensurate with the stated risk considering the effort and cost involved.
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Objective 6: Develop an information infrastructure that serves all components of the Agency and is compatible with the USDA backbone (Telecommunications Enterprise Network).

Strategy 1: Establish Internet connectivity at each ARS location consistent with USDA and Agency standards.

Strategy 2: Establish shared research and information databases (Action Team 6).

Strategy 3: Monitor and evaluate emerging IT trends.

GOAL 3: ARS staff possesses the skills necessary to meet the challenges of effectively delivering programs and services with information technology.

Rationale: The focus of this goal is to ensure acquisition and maintenance of the essential employee competencies needed to develop and support ARS information systems. The IT the Agency uses and needs is complex and must be updated as technology advances. This requires sustained management support of educational, training, and human resources recruitment activities.

Objective 1: Acquire and maintain core competency levels needed for program managers, system administrators, and system users.

Strategy 1: Assess the current capabilities of existing staff and identify training needs, establish benchmarks for various competency levels for managers, users and technical staff.

Strategy 2: Provide the necessary training.

Strategy 3: Acquire the employee core competency levels through aggressive recruiting or obtain skills through contracting services.

Objective 2: Establish a process to ensure ongoing support for mission systems.

Strategy 1: Develop a communications system to assure management awareness of new information technology capabilities.

Strategy 2: Identify resources to support local information systems.

GOAL 4: ARS information systems enable development of advanced knowledge-based systems and decision tools to bring the best science, data, and knowledge to bear on solving problems to maintain and enhance a rapidly changing agriculture.

Rationale: The focus of this goal is to promote more effective creation, documentation, dissemination, and utilization of scientific information and knowledge (e.g.: databases, knowledge bases, simulation models, visualization tools and scientific documentation) that bridge the gaps between science and decision makers and the public. Research and scientific findings are routinely documented and transferred to users via computers and electronic networks. The flexibility and complexity of the databases, knowledge bases, simulation models, and scientific documentation provide the decision maker with comprehensive, but often difficult-to-use tools. Improvement of these systems and decision tools to solve agricultural problems depends on the existence of information systems that facilitate their development and application.

Objective 1: Ensure that information systems support research and development of expert systems and decision tools.

Strategy 1: Ensure access to internal and external data bases, information, and knowledge (for example, real-time data on natural resources, census data, and other social/economic data).

Strategy 2: Develop communication capabilities to accommodate the virtual laboratory requirements.

Objective 2: Ensure that information systems support delivery of expert systems and decision tools that enhance technology transfer of ARS research results to the user.

Strategy 1: Develop an ARS policy to support the development and publication of user-models, expert systems, and other decision tools of the information systems.

Strategy 2: Ensure that information systems support data bases, knowledge bases, and research findings necessary to build expert systems and decision tools for technology transfer.

Strategy 3: Develop a process by which expert systems and decision tools are placed and supported in an information system and the public notified.

Objective 3: Provide and maintain data base and knowledge-base support for delivered expert systems and decision tools.

Strategy 1: Identify and maintain links to databases and other sources of information.

Strategy 2: Maintain currency and quality of ARS databases and information.

GOAL 5: Increase use of research results and information by continually improving information systems that facilitate awareness, access, transfer, preservation, and use of research accomplishments and agriculturally related information by researchers, educators, and the public.

Rationale: The focus of this goal is to implement a process for using IT to improve Agency information systems in ways that enable ARS customers and the public to better understand, use, and evaluate the results of ARS research. Access to scientific information and transfer of knowledge and technology developed through agricultural research are crucial to ensuring that the return of public investments in research are maximized for the public good. Public recognition of agricultural research is crucial for continued support of the ARS mission.

Objective 1: Develop an information communications plan.

Strategy 1: Conduct BAA on the Information Communication area in order to set policies and guidance on what information is to be shared internally and/or externally.

Strategy 2: Apply sound communication principles (message, objective, medium, presentation, distribution/access and cost/benefit).

Objective 2: Produce information in appropriate electronic formats about ARS research programs, projects, results, and benefits, as well as other agriculturally related information, databases and computerized bibliographic reference bases.

Strategy 1: Determine which electronic media will be most efficient, effective and flexible for both the users and providers of the information.

Strategy 2: Following existing and emerging standards, provide in electronic format conducive to long term public access and use, publications and other agriculturally related information such as AGRICOLA.

Strategy 3: Develop an information/communication strategy for National Programs (Action Team 5).

Objective 3: Provide for wide and easy electronic access to and distribution of agricultural information.

Strategy 1: Improve and maintain the utility of ARS web sites and other electronic media, to provide broader distribution and easier access to agricultural information.

Strategy 2: Expand ARS' collaborative approaches with other organizations in the sharing of agricultural information and resources.

Strategy 3: Support efforts that ensure the continued growth of information collections to meet existing and future needs of agricultural communities.

Objective 4: Make customer feedback and evaluation integral to information systems to improve access to and use of information.

Strategy 1: Obtain and evaluate internal and external feedback.

Strategy 2: Incorporate appropriate customer recommendations into improvements for access to research information and focus on helping users apply the results.

Objective 5: Preserve our agricultural heritage for future generations.

Strategy 1: Support a national effort for the preservation of agricultural documents.

Strategy 2: Implement a process for the preservation of USDA documents in electronic form.

Glossary

Note: Not all of these terms appear in the ISP text but are provided here, with emphasis on computer programs in the context of information technology, because of their close relationship and importance in the discussion and development of contemporary information systems in the ARS research environment.

Business Area

A major, distinct part of an organization's activity and mission comprised of a collection of associated business functions and related processes.

Business Area Analysis

A detailed study of each functional area (normally defined within the scope of a strategic plan), its data and processes plus the information used and produced

Customers

The public, cooperators, employees, and management of ARS who receive or are affected by ARS services and products.

Data

Symbols, numbers, words, graphics or otherwise from observations and measurements, that may be organized for analysis.

Decision Support System (DSS)

An organized set of computer programs that work together with data, information, and knowledge to assist a decision maker. The programs are designed to conduct analyses about possible courses of action to support a more informed decision. The DSS may incorporate a wide range of technology from basic data processing and manipulation through analytic relationships and simulation models to expert systems.

Decision Tool

Technology used to assist in analysis of data and information to help evaluate alternatives and/or select options as part of the decision making process. In contrast to decision support systems, most decision tools have been developed as stand-alone computer programs addressing parts of the overall management decision.

Electronic Database

A computerized and systematized collection of data grouped together and organized to enable search and retrieval.

Database Management System (DBMS)

A specialized set or system of computer programs that store, modify, and extract information from a database.

Electronic Knowledge-Base

An electronic database that stores knowledge used to solve problems in a particular problem area or a specific domain.

Electronic Knowledge Based System (or Knowledge Based System)

A set or system of computer programs that solve problems requiring specialized knowledge. This knowledge need not necessarily be acquired from human experts, a major difference from expert systems. Although the terms knowledge based system and expert system are often used interchangeably, the distinction is necessary to identify system performance comparable to human experts.

Expert System

A set or system of computer programs**,** which embodies organized data, organized knowledge, and sometimes simulation models in an area of expertise to perform as a skilled, effective consultant. The term "expert system" is used to signify that the knowledge was acquired from human experts.

Function

A group of business activities that together completely support one aspect or part of the organization's mission.

Goal

A broad result, aim, or end for which the organization works to achieve.

Information

A collection of data that has been organized by the meanings that human beings assign to the data using known conventions. The conventions may be as simple as grouping or as complex as conceptual and mathematical relationships describing the data. Information as used here connotes organized data and meaningful relationships. In contrast to knowledge, it does not imply a truthful or factual basis.

Information Architecture

The analytical models of an organization's activities and information needs and interactions used to define and construct integrated information systems.

Information Engineering

The application of an interlocking set of formal techniques for planning, analysis, design, and construction of integrated, organization-wide information systems.

Information Strategy Plan

The high-level analysis of the current business strategy, information needs, and functional requirements to comprehensively and logically develop new information resources, processes, and capabilities.

Information System

A discrete set of information resources and processes, automated or manual, organized for the collection, processing, maintenance, use, sharing, or dissemination of information.

Information Technology

The computers, software, telecommunications, and services applied to the processing of information.

Integrated Information System

An automated information system supporting one or more major business functions which that enables subsystems to share data and eliminate redundant data.

Knowledge

A body or representation of data, information, facts, and complex relationships including an awareness and understanding of what is known as true from them and their application in problem solving.

Objective

A more specific result that contributes to the attainment of a goal.

Performance Target

A predetermined measurable result of needed from an action or activity used to determine the degree of success or failure.

Strategies

Specific approaches used to achieve a specified or desired result.

Technology

The procedures, techniques, methods, or products used to apply a body of knowledge acquired through science to specific problems.

Information Technology Best Practices

Government Accounting Office Testimony
February 26, 1996

Best Practice		Appears in 1998 ISP at:
1. Recognize and communicate the urgency to change information management practices.	-	Introduction and Goal 2
2. Get line management involved and create ownership.	-	Goal 2 - Objective 3
3. Take action and maintain momentum.	-	Introduction - ISP Vision Statement, ¶ 2, 5,6, &7; and Goal 2
4. Anchor strategic planning in customer need and mission goals.	-	Introduction - ISP Vision Statement Goal 1 - Objectives 1 & 2
5. Measure the performance of key mission delivery processes.	-	Goal 1 - Objective 2 Goal 2 - Objective 4, Strategies 1 & 2 Goal 4
6. Focus on process improvements in context of an architecture.	-	Introduction - Purpose Statement (p. 1, ¶3)
7. Manage information system projects as investments.	-	Goal 2 - Objective 2
8. Integrate the planning, budgeting, and evaluation processes.	-	Goal 2 - Objectives 1, 2, 3, & 4 Goal 5 - Objective 4
9. Establish customer/supplier relationships between line and information management professionals.	-	ISP Vision Statement Goal 1 - Objective 1 Goal 2 - Objectives 1 & 4 Goal 4 Goal 5
10. Position a Chief Information Officer as a senior management partner.	-	Goal 2 - Objective 1
11. Upgrade skills and knowledge of line and information management professionals.	-	Goal 3

Successful Applications of Information Engineering

Each of the following organization's systems was developed with significant reliance on information engineering principles and techniques for achieving a successful application. Each system has been recognized in some manner at the Federal level for being a successful technology application.

Department of Agriculture, Food Safety and Inspection Service (FSIS)

> **Field Automation and Information Management (FAIM):** System improves the efficiency and effectiveness of the food inspection program, improves the quality of data, and reduces paperwork and errors.

Department of Justice

> **Joint Automated Booking System (JABS):** Automates and streamlines the Federal justice system's booking process enabling data sharing among law enforcement agencies.

Department of the Interior,

> **Automated Employee Payroll/Personnel Record Changes:** Gives individuals the power to update their own records to streamline service and reduce processing time and errors.

Environmental Protection Agency

> **Envirofacts Data Warehouse:** Uses a relational data base and World Wide Web technology to facilitate access to environmental information for the public and increases the information exchange between scientific/health/Government communities. Supports Superfund management, Hazardous Waste handler Data, Toxic Release Inventory, Water Discharge Permits, and AIRS Facility Subsystem.

Federal Housing Administration

> **FHS Comptroller Paperless Process:** Provides electronic exchange of business data among computer applications, eliminating the need to manually process data or re-enter data from one system to another.

Food and Drug Administration

> **Operational and Administrative system for Import Support (Oasis):** Facilitates and speeds the transfer of import information on goods entering the United States and reduces the initial approval time, eliminates wait at docks, and accommodates increased workloads.

Applications of IE *(continued)*

U.S. Customs Service, Office of Investigations

Investigations and Intelligence Operations: Used business process improvement and re-engineering principles in improving and streamlining the entire organization through better operational management and administrative oversight, elimination of field offices, increased authority to field managers, and increased reliance on information and communication technology.

Changes in IT Management

In recent years, Government agencies have had several high profile failures with information technology. USDA's own IT practices have been criticized by GAO and Congress. The following reflects the current environment in which ARS must develop and operate its IT system.

1. Information Technology Management Reform Act (The Clinger Cohen Act of 1996)

   This act requires:
   - establishing a Chief Information Officer (CIO) for each cabinet department;
   - integrating IT planning and decision-making with the strategic and budget planning processes;
   - establishing capital planning and investment control techniques and procedures; and
   - developing an information technology architecture to guide IT investment decisions.

2. The Government Performance and Results Act (GPRA)

   Consistent with and based on mandates to measure mission performance, executives should expect meaningful bottom-line improvements in the outcomes of key business process changes and applications of information system and related technologies. Senior management is expected to be involved in the selection, control, and evaluation of IT applications.

3. The General Accounting Office (GAO) Guidance

   The GAO published its testimony before the Subcommittee on Government Management, Information and Technology Committee on Government reform and oversight, U.S. House of Representatives (February 1996) in which it reflected on the best practices it found in its audits that resulted in improved performance and products, These practices are:

   - Recognize and communicate the urgency to change IT practices.
   - Involvement and commitment from top leadership.
   - Take action and maintain momentum.
   - Anchor strategic planning in customers needs and mission goals.
   - Focus on improving business processes in the context of an architecture..
   - Manage IT projects as investments.
   - Integrate the planning, budgeting, and evaluation processes.
   - Establish customer/supplier relationships between line and information management professionals.
   - Position a Chief Information Officer as a senior management partner.
   - Upgrade skills and knowledge of line and information management professionals.

4. The Office of Management and Budget (OMB) Guidance

   Congress tasked OMB to review IT investments as part of the budget process and report on the major benefit of major investments. OMB has issues guidelines for evaluating capital investments in IT.

Changes *(continued)*

5. Department of Agriculture Information Technology Reform Act (Senate Bill 805)

   This legislation hasn't been passed yet but the Act would transfer all agency IT funds to the USDA CIO and the CIO would provide leadership to complete the USDA reorganization and re-engineer agency processes if necessary. It requires the CIO to implement a capital planning and investment control process and to implement an IT architecture. In a related situation, the House has threatened to significantly reduce USDA's IT budget.

6. Department Actions,

   The Department established the Office of the Chief Information Officer (OCIO) to institute a moratorium on new information technology acquisitions, to establish an executive board to approve information technology investments, to support a strong management team, and strengthen the CIO authority to manage IT in USDA.

7. IT Guidelines of the USDA Chief Information Officer (CIO).

   The CIO is implementing an IT action plan to strengthen the corporate management to achieve greater sharing of information across organizational lines and to be assured that IT investment decisions are based on sound business principles. The CIO has five critical objectives.

   1. Ensuring that mission-critical information systems are Year 2000 compliant;

   2. Implementing a single information technology infrastructure and supporting organization for the Farm and Foreign Agricultural Services, the Rural Development agencies and the Natural Resources Conservation Service;

   3. Improving the Department-wide management of telecommunications;

   4. Developing policies and procedures for implementing the provisions of the Clinger-Cohen Act of 1996 through strengthening the capital planning processes, instituting an information technology program review and evaluation strategy, refining the enterprise-wide architecture, and developing a workforce planning capacity; and

   5. Building a strong management team and developing strategies for improving the corporate management of USDA's information infrastructure.

Attachment B

Information Technology Management
Report of Action Team #2
Establish an ARS Information Technology Investment Review Board

June 23, 1998

Team Members:

Chris Johnson	Computer System Analyst, Information Technology Division, Administrative and Financial Management, Beltsville, MD, Chair
George Foster	Laboratory Director, National Sedimentation Laboratory, Oxford, MS (retired)
Darrell Cole	Assistant Area Director, Beltsville Area, Beltsville, MD
Ruth Coy	Supervisory Publication Specialist, Information Staff, Administrator And Immediate Staffs, Beltsville, MD
Gary McCone	Associate Director - Automation, Information Systems Division, National Agricultural Library, Beltsville, MD
Carol Shelton	Branch Chief, Financial Management Division, Administrative and Financial Management, Beltsville, MD

Support Provided by:

Keith Anderson	Division Director, Information Technology Division, Administrative and Financial Management, Beltsville, MD

Team Charge

To develop a charter and to propose membership for an Information Technology Investment Review Board (ITIRB) for ARS.

Background

The federal government is pursuing major changes in the way it manages investments and development of information technology (IT). The Office of Management and Budget (OMB) and the general Accounting Office (GAO) have responded to new Congressional mandates under the Information Technology Management Reform Act (ITMRA), also known as the Clinger-Cohen Act. It requires executive agencies to view every major IT decision primarily as a choice of where to invest scarce agency resources in terms of likely program outcomes. The Clinger-Cohen Act mandates improved management of IT projects with the expected result that the systems be delivered on time and will perform to expectations, and funds will have been efficiently and effectively spent. Agencies are required to establish Chief Information Officer (CIO) positions and an ITIRB composed of upper level managers to represent the integration of IT with mission programs at the agencies' highest level.

Such a board has been established at the Department level of USDA called the Executive Information Technology Investment Review Board (EITIRB) and several USDA agencies already have functioning boards. Therefore, ARS needs to establish its own ITIRB. The approach of the team was to develop a simple charter and one that would be readily approved by the USDA.

Team Activities:

The team collected and reviewed other agencies' ITIRB charters including the Forest Service, the Natural Resources Conservation Service, the Farm Services Agency, and the Rural Development Agency. Also, a charter from the U.S. Department of Transportation was reviewed. Then the team developed a draft charter closely modeled after the USDA's ETIRB.

The team met in May in Beltsville, Maryland to finalize the charter and to discuss the mechanics of how the review board would function. At the meeting, Marilyn Holland and Dave Allardyce from the USDA Office of the Chief Information Officer (OCIO) provided comments on the draft charter and essentially concurred with the ARS approach. Based their comments, ARS can expect its charter to be accepted by the OCIO. They also discussed the USDA's implementation of the IT Capital Planning and Investment Control program and the supporting computer program called the Information Technology Investment Portfolio System (I-TIPS). I-TIPS documents an agency's life cycle management of its IT systems from concept initiation through requirements analysis to operational evaluation.

Proposed Board

The proposed membership of the board is:

Associate Administrator (Chair)
Deputy Administrator, National Program Staff
Deputy Administrator, Administrative and Financial Management
Budget Officer, Budget and Program Management Staff
Director, National Agricultural Library
One Area Director selected by the Administrator
Chief Information Officer (nonvoting Executive Secretary)

The board would meet quarterly in association with the meetings of the Administrator's Council. The CIO would support the board's activity by serving as executive secretary to the board.

Report of Action Team #2

Operational Procedures:

The USDA expectations are that ARS will implement and use the procedures outlined in the USDA Guide to Implementing Information Technology Capital Planning and Investment Control. It involves the three phases of selection, control, and evaluation. The guide provides a comprehensive process to evaluate the worthiness of a system for investment and development. A screening and scoring process enables the ranking projects for management decisions on projects to fund.

In addition to being a guide in selecting projects to initiate, the system provides a basis for tracking projects over their life cycle, documenting costs and benefits, and recording lessons learned in the project.

I-TIPS is designed to assist managers assess IT initiatives in terms of their costs, risks, and expected returns. It is a database of information describing individual IT projects. I-TIPS aggregates IT information into a system portfolio for the agency to use for decision making and for Departmental to exercise its oversight for cross cutting applications and to satisfy its responsibilities for overall accountability. An IT development project leader would enter system information into I-TIPS to eventually be passed upward through normal management channels for review by Area Office, National Program Staff, and other divisions before reaching the ITIRB.

Criteria for Projects to be Reviewed by Board:

Major IT system projects will be reviewed by the board. As described in the charter, these projects will include Mission Critical Systems, those that support core business activities or processes. Also, systems to be supported by the ARS High Priority Requirements List (HPRL) process involving information IT greater than $1 million require ITIRB review. Those systems requiring a capital investment acquisition costs greater than $15 million must be reviewed by the USDA EITIRB.

While only the very major projects will be reviewed by the ITIRB, ARS still is required ensure that all IT projects are well managed. Locations need to develop multi-year IT plans and begin to include future IT needs as a part their Annual Resource Management Plan (ARMP) submittal.

Issues and Concerns

The team also surfaced important related issues.

1. Concern surfaced about how the Department would influence ARS' IT investments. A "one-size-fits-all" approach should not be imposed on the agency given ARS' diverse

operation and the nature of research being on the cutting edge where new, risky ventures are routine.

Rationale: ARS has a wide and diverse information technology function. A critical component of the ARS mission is the use of information technology to generate, analyze, process, store, and disseminate original scientific information. The agency uses IT to conduct its essential administrative functions. It also uses extensive databases for program management. Effective management of the agency requires integration of the business functions with program functions. The agency produces information technology products in the form of computer software such as water quality models and expert systems to manage dairy herds. The end users of these products are other government agencies, producers, and others in the private sector. The agency maintains large scientific databases important to genetics research, for example. The principal users of this information are other scientists within and outside of ARS. The agency through the National Agricultural Library is the world's leading collector of agricultural literature and uses information technology to handle this literature and to make it available to users worldwide.

2. In addition, given this diversity, the CIO's role will be very important for coordinating the agency's information technology activities and supporting the operation of the ITIRB.

3. Care must be exercised in the management of information technology resources so that program activities are not hampered. In activities like development of mathematical computer models for use by other agencies, activities that are strictly related computer software design become closely integrated with research program activities. However, the importance of effective management of IT to produce quality software on time and within budget for research program activities should be recognized as a critical success factor.

Recommendation

Because of the dynamic requirements of ARS to support its research efforts, the team recommends that the ARS ITIRB actively solicit input from a representative cross section of the agency as it reviews proposals.

United States Department of Agriculture
Agricultural Research Service

CHARTER

Information Technology Investment Review Board

July 1998

I. PURPOSE

The purpose of this charter is to define the authority, membership, roles, and responsibilities of the Information Technology Investment Review Board (ITIRB) and its relationship to other internal and external bodies.

II. BACKGROUND

The Department of Agriculture has established an Executive Information Technology Investment Review Board that administers a capital planning and investment control process for making technology, budget, financial, and program management decisions. As part of this process, each Agency within the Department of Agriculture has been directed to establish a board with similar functions.

III. MEMBERSHIP

The ITIRB consists of senior managers from the Agricultural Research Service (ARS): Associate Administrator (Chair); Deputy Administrator, National Program Staff; Deputy Administrator, Administrative and Financial Management; Budget Officer, Budget and Program Management Staff; Director, National Agricultural Library; one Area Director selected by the Administrator; and the Chief Information Officer (nonvoting Executive Secretary).

IV. ROLES AND RESPONSIBILITIES

The ITIRB will approve new information technology investments and evaluate existing projects and operational systems to create an ARS Information Technology investment portfolio that best supports the Agency mission and program delivery processes.

Specific investments reviewed by the Board will include Mission Critical Systems, which is a system supporting a core businessactivity or process, systems requiring a capital investment greater than $15 million, and HPRL (High Priority Requirements Lists) requests to Headquarters involving information technology investments greater than $1 million. IT proposals reviewed by the Board will be processed through routine management channels.

The Board will use a standard set of criteria developed by USDA and described in "Guide To Implementing IT Capital Planning and Investment Control." The criteria will include a consideration of Department and Agency wide impact, visibility, cost, risk, architecture, and standards.

In the scope of the ITIRB, information technology investment encompasses all investments involving information technology and information resources, including equipment, IRM services, information or application system design, development and maintenance, regardless of whether such work is performed by government employees or contracted out.

V. PROCESS. The Boards actions will be governed by the USDA "Guide to Implementing IT Capital Planning and Investment Control." This process applies the Government and Accounting Office's best practices approach which involves three phases of "select", "control", and "evaluate" for effective information technology management.

SELECT. This phase involves screening new proposals and self assessments of ongoing investments. Screening and numeral scoring are based on criteria related to the major areas of Mission, Risk, and Cost/Benefit. Using scoring results as the primary guide, investments are selected. The I-TIPS (Information Technology Investment Portfolio System) Investment Manager, an automated software tool, is used to facilitate the development of documentation needed to describe the prospective investment and to numerical score according to specific criteria contained in the software.

CONTROL. During this phase, the progress of the investment is monitored according to performance criteria and direct corrective action is taken to ensure that milestones, performance requirements, and adherence to budget and schedule are being met. Successes and shortfalls will be identified and used to ensure continuous process improvement.

EVALUATION. A post implementation review identifies lessons learned, which are documented and applied in future investments. A major focus will be on how well the investment met its mission performance, budget, and schedule goals.

VI. MEETINGS

The ITIRB will meet quarterly in conjunction with meetings of the Administrator's Council to conduct ITIRB business or more often if the review of a specific proposal is requested.

The Executive Secretary will prepare an agenda for all meetings, prepare and distribute minutes for all meetings, and perform other scheduling, correspondence, and communication functions for the ITIRB. An agenda and notice of meeting will be provide to ITIRB members by the Executive Secretary 10 working days before the meeting.

The Executive Secretary will record and distribute minutes of each meeting and will distribute draft minutes within 5 working days of each meeting to Board members. Comments will be due 5 working days after the receipt of the draft for incorporation in the final minutes. Final minutes will be distributed with the agenda for the next meeting.

VII. VOTING

The ITIRB will make decisions, including revisions to this charter, by voting. In order for a vote to occur, a quorum must be present. A quorum is two thirds of the voting members in person, by telephone, by video conference, or by proxy. Each member will have one vote.

Attachment C

STRENGTHEN MANAGEMENT INVOLVEMENT

WITH

INFORMATION TECHNOLOGY

By the

ARS Information Technology Management
Steering Committee
Action Team #3

Adrianna Hewings, Chair

and

John Crew, Bruce Kinzel, Chuck Onstad, Maria Pisa, and Gail Poulos

BACKGROUND

The Information Technology Management (ITM) Action Team 3 - Strengthen Management Involvement with Information Technology is charged with developing approaches and strategies to increase the involvement of agency managers in IT decision making in support of the Information Technology Review Board. This Team's charge crosses over and touches on many of the other Action Teams area of responsibility. We have purposely not coordinated with those teams in order to preserve a certain degree of independence in ideas and strategies. The strategies developed focus on structure relating to leadership, management and staff, and education and awareness of senior management regarding ITM. The strategies have been developed under the framework of:

> **The ARS mission:** to provide access to agricultural information and develop new knowledge and technology needed to solve technical agricultural problems of broad scope and high national priority. The goal is to ensure an adequate supply of high quality, safe food and other agricultural products to meet the nutritional needs of consumers, sustain a competitive food and agricultural economy, to enhance quality of life and economic opportunity for rural citizens and society as a whole, and to maintain a quality environment and natural resource base.
>
> **ARS ITM Strategic Plan Vision Statement:** ARS information systems will be mission driven, integrated, based in shared databases, and responsive to customer needs.
>
> **The Clinger-Cohen Act** requires executive agencies to develop a capital planning and investment control process for making technology, budget, financial and program management decisions directly linked to and supportive of, program objectives.
>
> **Executive Order 13011:** Federal Information Technology; July 17, 1996 requires that Agencies make measurable improvements in mission performance and service delivery to the public through the strategic application of information technology. It further requires a coordinated approach that builds on existing structures and successful practices to provide maximum benefit across the federal Government.

INTRODUCTION

The impact of ITM and the pace of change creates challenging times for a diverse agency such as ARS. Important decisions concerning ITM need to be made by the Agency, Areas and locations. In order to maximize the resources the Agency expends on Information Technology, an ITM structure needs to be developed and embraced by management. During these times of rapid change, how the decisions are made can be as important as the decision itself.

In the information age, top executives have the responsibility not only to define business goals, but also to initiate, mandate, and facilitate major changes in ITM to support the achievement of

these goals. Top executives must get personally involved in understanding relative costs, benefits, risks, and returns associated with information technology investments they are making decisions about and allocating resources to. Unless top executives make these linkages, meaningful change can be slow and sometimes impossible.

ARS currently faces a crossroad that can lead to a transformation in ITM and how information technology (IT) is utilized within the Agency. Information Technology Management can be defined as:

> **the process of managing information technology, which encompasses information itself, hardware and software operated by an organization, to accomplish the agency mission.**

ARS needs to look at not only the real costs associated with ITM, but also the cost of lost opportunities by not having an ITM infrastructure needed to compete in the current as well as future environment. Opportunities that cannot be imagined at present will become possible, even probable, if we have the imagination and vision now to address what may be needed in the future.

Positive Impacts of Implementing ITM within ARS:

- Maintain ARS' preeminence, relevance and impact to the agricultural community and the American consumer.
- Position ARS to compete and excel at the national and international level.
- Build upon ARS' strength of diversity through state-of-the-art networking of research laboratories around the world that excel though synergy, and enhance the accomplishments of individual laboratories.
- Build upon the Agency's strength of diversity in science and geographic location.
- Provide the integrated IT infrastructure that is essential to achieving the Agency's research mission.
- Provide a means to anticipate the future, grasp the moment, and achieve the vision.

In the past, ARS has maintained separate IT systems for accomplishing science, program management, acquisition and dissemination of information and administrative management needs. Recognizing that some of these program and business functions may still have certain separate components, how to accomplish these tasks in the current and future world of IT is becoming increasingly transparent and integrated. Recent advancements in IT have made separate systems no longer necessary, but indeed a liability to organizations competing in the new millennium.

Impact of Not Implementing ITM

- Poor integration of program, information resources, business systems and IT.
- Lack of accountability and disciplined decision making for IT investments.
- Continued fragmentation of computer based resources and under controlled capital investment in out-dated technology.
- Lost opportunities in research coordination and collaboration through isolation of the SY whether in a large laboratory or isolated location.

ARS spends significant resources on IT. The question is--how will those resources be spent and how will they be utilized. While each phase of a sound investment process has its own requirements for successful implementation, there are some overall organizational attributes which are critical to successful IT investment evaluation:

- senior management attention
- overall mission focus
- a comprehensive, enterprise wide approach to technology investment.

Successful implementation of the new IT initiative will require a significant cultural transformation and may entail some organizational restructuring. The following recommendations are designed to facilitate and ease the transition and provide our senior managers with an opportunity to acquire the information they need to support ITM in ARS.

CIO POSITION

***Recommendation*: Establish ARS Chief Information Officer (CIO) position within ARS.** ARS should establish a CIO position. The CIO position should be at a senior management level reporting to the Administrator, making the CIO an equal partner with other senior officials in decision-making with regard to ITM issues. This position is critical to building an agency-wide information management capability that is responsive to customer needs. Further, ARS should support the position with an effective organizational framework for leading agency-wide ITM initiatives.

Specifically, ARS should:

- appoint a CIO with demonstrated leadership in science and technology and expertise in information technology management/systems,
- position the CIO as a senior management partner who reports directly to the Administrator and functions as an equal partner with other senior officials in decision-making with regard to information technology policy and issues,

- task the CIO to oversee ITM program and policies, and provide technical expertise for Agency-wide information systems,
- develop strategies and specific plans for hiring, training, and professional development of personnel to achieve a highly qualified ITM workforce in ARS.

CIO Attributes: Like other senior mangers in ARS, the program orientation of the CIO will be primary. A qualified CIO must be a visionary leader with a combination of research experience, expertise in ITM, and demonstrated skill in integrating business, research, and information systems. The CIO must:

- understand the mission and work in partnership with top management to help increase awareness, understanding, and skill in identifying and resolving information management issues,
- serve as a catalyst for designing and facilitating implementation of new organizational capabilities by effectively communicating the role of information systems in mission support and program delivery, and
- represent ARS IT issues to the USDA CIO and play a leadership role in decision making at the Department level where the future of ITM in USDA is shaped and determined.

Critical to the success of the CIO are the expertise and influence that the right person can bring to bear on strategic information technology management issues and his/her ability to capture potential from new opportunities. Hence, an effective CIO would:

- serve as a program advocate and a bridge between the National Program Staff, line management, program and administrative management and IT professionals,
- advise top executives and senior managers on the worthiness of major technology decisions and investments,
- work with managers to understand and define the role of IT in creating a joint partnership with line management to achieve successful program and business outcomes,
- design and manage the system architecture supporting the program and business needs to enhance the decision-making processes of the organization, and
- set and enforce appropriate technical standards to facilitate and communicate the effective use of information resources throughout the agency.

IT STAFF

Recommendation: **Consolidate appropriate IT staff under the CIO.**

The CIO's staff provides the framework for leading the agency-wide ITM initiatives. The IT staff's responsibility focuses on Agency communications systems, evaluation of technology, and

agency-wide information data management, IT security, and innovative uses of IT in the research mission. Having an IT Staff reporting to the CIO helps to ensure that IT systems are developed, managed, and communicated with an overall Agency perspective, minimizing the fragmented IT approach of the past.

In keeping with Agency policy and custom, IT management decisions should be made in a matrix management environment. Just as important decisions impacting program direction or management are made in a consultative way between the National Program Staff and the Area Directors, decisions of similar import would be made in a consultative way between the IT staff and affected units. De-centralized functions must be maintained for specific organizational support, specific project support and IT driven bench instrumentation.

ARS Headquarters, NAL, AFM, NPS, Area Offices, and locations would maintain management responsibility for their required IT staffs. Flexibility of local ITM would be maintained, while the CIO's IT Staff establishes standards for any Agency IT resource that communicates externally from it's operating environment. Independence is accepted to the point where communication is needed with others, or Agency IT support resources are required.

The specific areas of responsibility for the IT staff are:

- Work in partnership with scientists to promote the effective use of IT in support of the research mission.
- Management of corporate/business information systems.
- Management/enhancement of the Agency's communications systems (voice, data, and video).
- Technical evaluation of IT investments - software, hardware, and systems.
- IT security.
- IT policy and procedures.
- Informatics - the "what if" group of IT research fellows.

The informatics function is something new and very important to the ARS mission. In essence this is the CIO's research staff.

- This staff maintains an awareness of innovative resources and trends in IT that can enhance the Agency's mission
- They act as consultants to the bench scientist in using and improving IT within the research arena.
- They act as program liaisons.

It is important that this staff stay fresh and up to date on IT issues. The use of a post doc model through term appointments should be considered.

EXECUTIVE INFORMATION TECHNOLOGY INVESTMENT REVIEW BOARD (EITIRB)

Recommendation: **Establish an EITIRB**.

The Department of Agriculture has established an Executive Information Technology Investment Review Board (EITIRB) that administers a capital planning and investment control process for making technology, budget, financial, and program management decisions. As part of this process, each Agency within the Department of Agriculture has been directed to establish a board with similar counterpart functions with their respective Agency.

A critical part of senior management buy-in is the direct involvement of senior management in the IT decision making process. This is best achieved by formation of an Information Technology Investment Review Board (ITIRB) consistent with the provisions of the Clinger-Cohen Act and the Departmental requirement. To ensure senior management buy in the ARS ITIRB should be configured as an Executive ITIRB with the following potential members.

Administrator as Chair with senior management comprised of:

Associate Administrator
One or more representatives from the Deputy Administrators of the National Program Staff, Administrative and Financial Management
One or more representatives from the Assistant Administrators
One or more representatives from the Area Directors, NAL Director
Information Staff Director
CIO (Non-voting executive secretary)

This should ensure that the following organizational attributes lead to successful investment evaluation:

- senior management attention.
- overall mission focus.
- a comprehensive, enterprise-wide approach to technology investment.

Key relationships:

The CIO will maintain a close relationship with the ARS Information Technology User Group (ITUG), the USDA IRM Council, the Administrators Council, and other appropriate organizations within and outside ARS, and solicit their advice and counsel for selection issues to bring before the ARS EITIRB.

INFORMATION TECHNOLOGY USERS GROUP (ITUG)

Recommendation: **Establish an ITUG.**

The ITUG will promote active exchange of information and expertise link between the Agency's most proficient and innovative users of IT and the CIO and staff.

- The ITUG will bring forward new IT uses, problems and challenges that have the potential to impact the Agency's effectiveness in providing IT resources and services to its customers.
- The group should meet on a regular basis (3-4 times per year); with rotating membership.
- Group membership should be mixed to include representatives from research, management, NAL and AFM, with an appropriate balance of field and HQ personnel. It should be recognized that technological expertise exists at all levels of the organization, therefore the best and the brightest should be recommended for ITUG.

EDUCATION/AWARENESS/TRAINING

Three recommendations are made to accomplish a degree of education and awareness of senior management for ITM and active exchange related to technology innovations.

***Recommendation*: the Administrator hold a retreat for Senior ARS Management.**

The need for ARS to adopt an Information Technology strategy may not be obvious to the "computer literate" and may be even less apparent to those managers who rely on others to transmit and receive electronic information. Ongoing technological advances, particularly very high speed processing chips, new network software and hardware, and the Internet have stimulated new approaches to managing information.

A senior management retreat should address how a coherent information technology policy and a comprehensive information technology program can add value to ARS Research programs, information resources, and business systems.

Partial list of suggested topics for discussion and training at the retreat:

What is ITM?

USDA ITM initiatives and compliance issues.

How ITM can improve program operations and service delivery.

ARS ITM plans for the future.

Opportunities lost by not embracing an innovative ITM policy.

The costs and benefits of moving to a new ITM approach.

IT security issues.

The expected outcome of the retreat is a common grounding of senior management in ITM, and a foundation for senior management buy-in to the changes needed within the Agency to support ITM.

The senior manager training/retreat:

- needs to be organized and facilitated by an independent contractor.
- needs to use a survey to identify perceptions and information gaps and define appropriate topics for the retreat.
- should be considered required, not optional, for attendance of designated senior managers in order to emphasize the importance of the ITM initiative.

Recommendation: **Engage a vendor to survey ARS senior managers to determine perceptions and attitudes toward IT and knowledge of IT issues.**

The widespread and rapid acceptance of new IT tools and techniques has created differences in perspective between the small cadre of users using these new approaches and the large cadre of potential users and beneficiaries still using computer technology in a more traditional way. To design a workshop that will best address IT issues that are relevant, senior managers, should be given an opportunity to express their needs.

Partial list of suggested questions for the survey:

Given the following definition of ITM,

> *ITM is the process of managing information technology, which encompasses information itself, hardware and software operated by an organization, to accomplish Agency missions.*

What could an improved Information Technology Management system do to increase your productivity? The productivity of the units you supervise or oversee?

Where should IT staff and resources reside in the Agency organization?

Is ITM a good investment? Why or why not?

Agricultural Research Service

PROGRAM/PROJECT MANAGEMENT BUSINESS AREA ANALYSIS

Prepared for:
The ARS Information Technology Management Steering Committee
August, 1998

Executive Summary

This report presents the results of the Agricultural Research Service (ARS) Program/Project Management Business Area Analysis (BAA) project. This project management BAA project was established to develop a conceptual framework of the processes and information required to manage agency programs, research projects, and resources. This framework identifies ways to improve those processes and is the basis for requirements for a new and integrated program and research management information system.

Dr. Ric Dunkle, Midwest Area Director, and David Rust, Program Planning Advisor for the National Program Staff, served as co-executive sponsors. Jennifer Clouse, computer specialist in the Information Technology Division, organized and led the project. Nineteen ARS program staff provided their insights, knowledge, and experience on program/project management strategies and processes.

The objectives of the project were to:

- Examine and redefine processes in need of re-engineering or improvement/modernization
- Develop a broadly focused (or coarse grain) model of the business area
- Develop business requirements for a new program management system

The scope of the business area was defined in terms of the processes and information relevant to three broad functions:

- Program Management
- Research Project Implementation, and
- Resource Management

The primary results of the Program/Project Management BAA are a set of models characterizing the business purpose and drivers, the functions and processes performed by the organization to achieve that purpose, and the information structure supporting those processes. These models are contained in this report and the accompanying appendicies.

Another product of the effort is a set of recommended next steps for addressing process improvement needs and continuing the process towards a complete enterprise business architecture and developing or acquiring automated systems support that meets the business requirements outlined in the BAA.

The recommended next steps are presented in two categories as follows:

Conceptual Business Model and Process Management

1. Perform process improvements/redesigns for peer review processes, and research agreement processes. Formalize/structure national program planning and review/evaluation processes and resolve outstanding issues about the reporting relationships between national programs and CRIS projects - (5 months)

2. Achieve a broader consensus on the business model concepts and process/information requirements for National Program Planning and Management, Research Project Implementation, and their linkages and effects on Resource Management (budget formulation, resource planning and resource allocation) - (2 months)

3. Implement the agreed-upon business processes through policy direction and training - (One month)

4. Incorporate or expand upon the base business model in areas such as information management, technology transfer, and resource management to integrate in the core program management information system. - (8 months)

Integrated Systems Support

1. Survey existing or commercial systems for possible use or adaptation for ARS. One system that should be examined has been developed by Agriculture Canada - (3 months)

2. Perform Capital Planning and Investment control and project planning for the acquisition or development of a new integrated corporate information system for program management- (2 months)

3. Train and develop ARS technology staff to develop/support the new platform and information system - (ongoing until March 99 and beyond)

4. Acquire or commence develop the new information system. (This task is likely to take longer than one year for full capability and full system implementation.)

Estimated resource requirements for these next steps are $915,520 through March of 2000, including $622,520 of existing resources (in-house salaries) that should be focused on these tasks. The remaining $293,000 is estimated travel/supplies and contractual costs for professional information technology training, consulting and software engineering services. These estimates are rough as the in-house resource usage, time-frames and dollar amounts required for purchasing and implementing a new information system may be significantly different than those that would be required to develop and implement a custom system in-house.

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Introduction

This report presents the results of the Agricultural Research Service (ARS) Program/Project Management Business Area Analysis (BAA) project. The Program/Project Management BAA project was established to develop a conceptual framework of business processes and information required to facilitate effective and more efficient ways of managing agency programs, research projects, and the resources needed to carry them out. This framework is intended to serve as the basis for automated information system requirements of a new and integrated program and research management information system.

Background

The nature of program and project management in ARS is changing with the adoption of the new National Program research system and an increased emphasis on sharing timely, accurate, and relevant information on agency research programs among internal multi-disciplinary teams and to agency customers and stakeholders. At the same time, ARS strives to minimize the administrative burden on scientific staff and reduce the amount of time and effort required to perform routine program administration tasks.

In order to meet the operational challenges brought about by these changes, ARS has recognized that the program management processes, practices and information systems that have been in place for many years must be reassessed, redesigned, and modernized.

Program Management and Information Technology

Information technology plays an important role in accomplishing and implementing a new and improved way of doing program and project management. Current mission-critical and support systems are encroached with old requirements and even older technology that hinders the Agency's ability to move forward and progress through a changing business environment. Key systems are programmed in outdated database software and run on technical platforms that are obsolete and increasingly more difficult to manage and maintain. Old computer technology and legacy systems such as the Research Management Information and the Annual Resource Management Planning System must be replaced with modern and maintainable integrated systems that meet new business management requirements.

Concurrently, the Department of Agriculture, Congress and the Office of Management and Budget now call for agencies to have an information technology program and investment strategy that is based upon the strategic and mission-critical requirements and thrusts of the Agency, is grounded in an enterprise business and technology architecture, and is consistent with emerging Departmental architectures and standards. These pressures further compel ARS to take definitive and appropriate

action towards defining the core business of the Agency in a business architecture and to deliver modernized and streamlined processes and information systems.

The ARS ITMSC and the Program/Project Management BAA Project

In early 1997 the ARS Information Technology Management Steering Committee (ITMSC) was formed to assess the overall information technology management program of ARS and identify and prioritize specific needs and issues to address in improving the program. The steering committee commissioned and funded project teams to address six critical needs in ARS information technology management. One of the seven projects initiated was the Program/Project Management BAA, a developmental process to analyze and establish updated requirements and a conceptual design for a modernized and integrated business system to support the program and resource management functions of the agency.

The steering committee designated Dr. Ric Dunkle, Director of the ARS Midwest Area, and Mr. David Rust, Program Planning Advisor to the Deputy Administrator of the National Program Staff as co-executive sponsors of the Program/Project Management BAA to champion the project and Jennifer Clouse of the Information Technology Division to organize and lead the effort. Dr. Dunkle and Mr. Rust selected several experienced and forward-thinking program and resource management staff to serve on the project team.

Project Design and Objectives

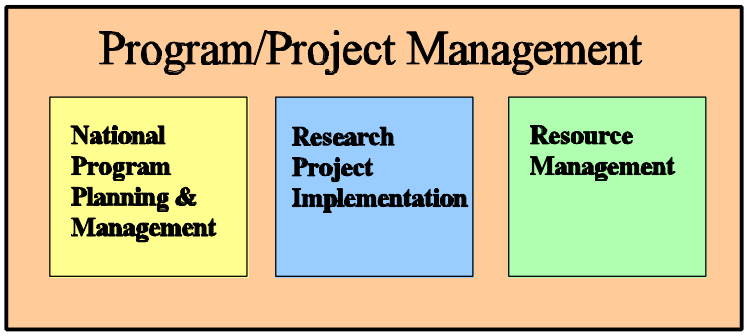
Program/Project Management BAA Objectives

- **To examine and redefine processes in need of re-engineering or improvement/modernization**
- **To develop a broadly-focused (or coarse grain) model of the business area, and**
- **To develop business requirements for a new program management system**

The Program/Project Management BAA project approach was designed to couple strategic business requirements analysis for the program/project management business area (a set of functions, processes and information requirements supporting those processes) with structured analysis of business requirements for the redesign of a new program management information system. Executed in two phases, the project design entailed defining the core business of program management as it needs to be in the new business environment by developing a high level business architecture model (Phase One) and then further developing that model into more detail for processes and data targeted to be supported by a new program management system (Phase Two.)

Project Scope

The scope of the business area was defined in terms of the processes and information relevant to three broad functions, **Program Management** (National Programs), **Research Project Implementation**, and **Resource Management** (including budget formulation, resource allocation, and resource management planning.)



Project Process

The Phase One project team assembled in December 1997 to kick-off the effort, and subsequently met for three facilitated workshops in Beltsville, MD between February to July 1998 to develop the high-level business model of processes and information needs. For Phase Two, the majority of Phase One team members continued in their participation, and the team was extended to include several new members to provide additional functional expertise and experience. The facilitation and support team recorded and developed the project products from the team's workshop materials.

Methods

As the name suggests, the project was planned and executed as an abbreviated type of business area analysis - a method used to design and model a cohesive business system.

Business Area Analysis Method Objectives

- **Provide a clear understanding of the business and how its activities interrelate**
- **Provide an architectural framework for the building of systems in an information-based enterprise**
- **Provide a framework such that separately built systems will work together**
- **Trigger the rethinking of procedures in the enterprise so that they are as efficient as possible using modern technology**
- **Identify requirements of highest priority**

A business area analysis is usually performed for the purpose of communicating the rules and requirements of a business system to those responsible for providing automated support to that business. A glossary of methodology-related terms is included as Appendix D.

Using analytical and modeling techniques common in the systems engineering industry, the Program/Project Management BAA entailed developing process and information models captured in a computer-aided software engineering (CASE) tool. These models can be further defined for the purpose of information system design. The conceptual (or business -view) models of processes and data can then be translated into logical models to be implemented in a computer system (see figure 1.) The project core team also developed basic representations of Program/Project Management data for use by internal and contractual technical staff in developing a new information system.

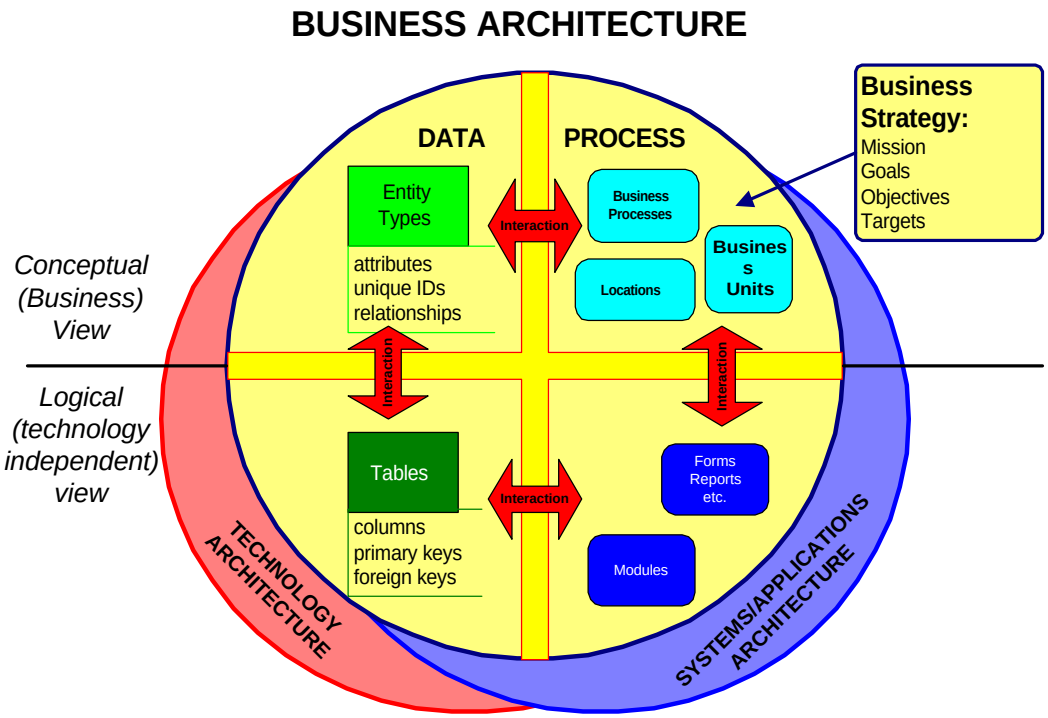


Figure 1

Project Team

The following individuals participated in full or in part in the Program/Project Management BAA:

Project Management Team

Dr. Ric Dunkle, Director, MWA, Co-Executive Sponsor
David Rust, Program Planning Advisor, NPS, Co-Executive Sponsor
Jennifer Clouse, Computer Specialist, AFM-ITD, Project Leader

Participants

Patricia Bothast, Program Analyst, MWA
Dr. Al Dedrick, Associate Deputy Administrator, NPS
Dr. Dell Delfosse, National Program Leader, NPS
Pete Lombardo, Computer Specialist, NPS
Steve Helmrich, Director, AFM-FMD
Dr. William Marmer, Research Leader, NAA
Wilda Martinez, Director, NAA
Pamela Mason, Program Analyst, NPS
Kathy Michels, Budget Analyst, OA-BPMS
Jan Overton, Location Administrative Officer, NWA
Debbie Perry, Executive Secretary, SAA
Dr. John Radin, National Program Leader, NPS
Scott Rieland, Computer Specialist, NPS
James Rogers, Budget and Fiscal Officer, NAA
Tonja Socks, Computer Specialist, NPS
Dr. Morse Solomon, Research Leader, BA
Dr. Jean Steiner, Research Leader, SAA
Curtis Wilburn, Grants and Agreements Specialist, AFM-EAD
David Young, Director, AFM-EAD

Facilitation and Support

Connie Cronin, Computer Specialist, AFM-ITD
Erwin Miller, Computer Specialist, AFM-ITD
Jeanne Rector, Management Analyst, AFM-ITD

Project Contact

For more information on the Program/Project Management Business Area Analysis project, please contact Ms. Jennifer Clouse, ARS Information Technology Division at (301) 504-1115.

BAA Results

The primary results of the Program/Project Management BAA effort are a set of models characterizing the business purpose and drivers, the functions and processes performed by the organization to achieve that purpose, and the information structure supporting those processes. Another product of the BAA effort is a set of recommended next steps for addressing process improvement needs and continuing the BAA process towards a complete enterprise business architecture and developing or acquiring automated systems support that meets the business requirements outlined in the BAA models.

The BAA results are organized and presented in the following sections:

- **Business Organization and Direction**
- **Major Processes and Information Requirements**

This section of the BAA report contains the complete model for Business Organization and Direction and a narrative overview of Major Processes and Information Requirements. The full models for Major Processes and Information Requirements can be found in Appendices A, B, and C.

The content of model results was developed by the project team participants. The Next Steps for the effort were developed by Jennifer Clouse and Pamela Mason.

Business Organization and Direction

Team Vision/Mission Statement for Program/Project Management

ARS research program and project management business processes and systems are designed and implemented to effectively and efficiently meet current and projected agency and stakeholder requirements in the generation, development and adaption of new knowledge and technologies.

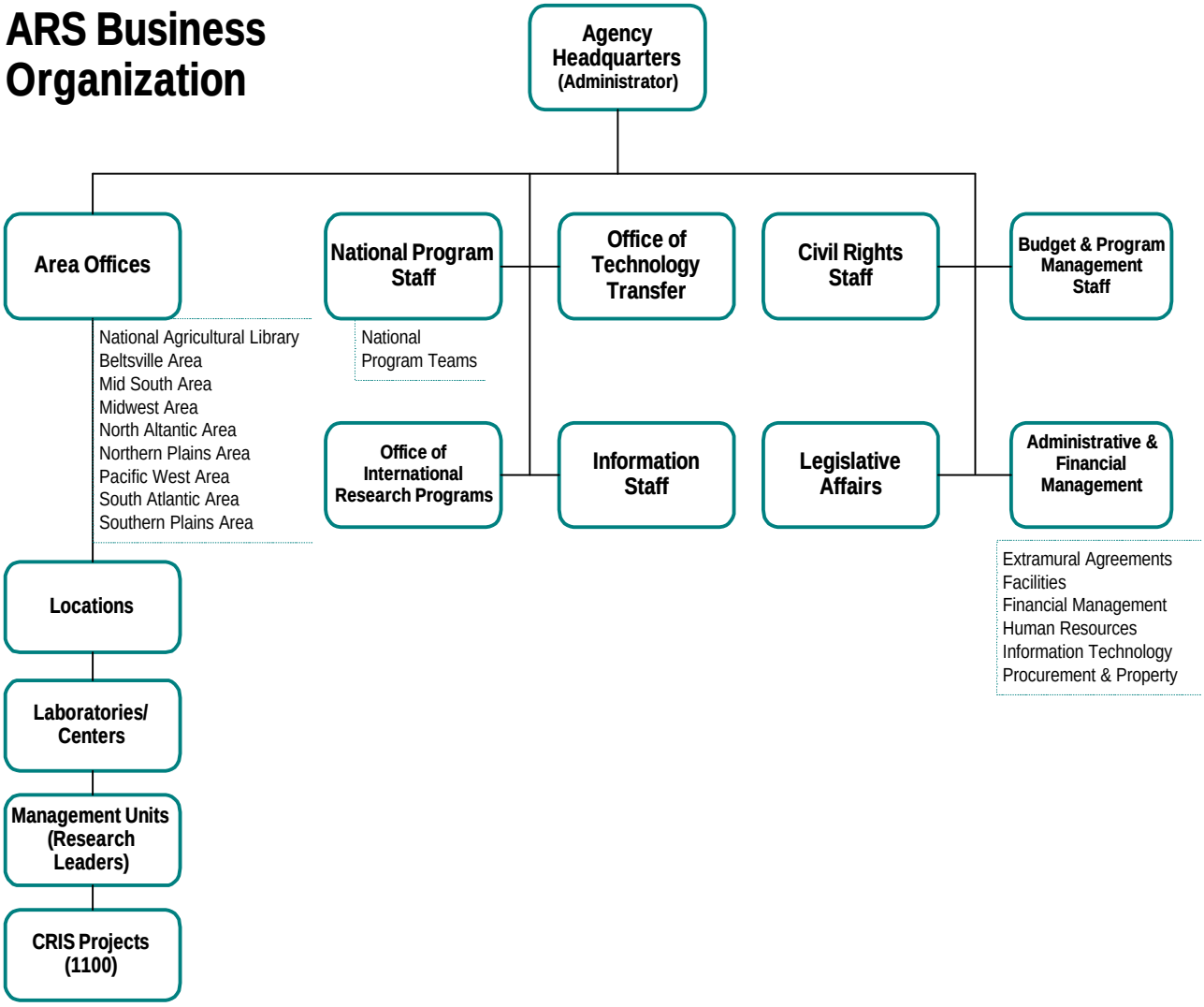
Organizational/Business Purpose

To serve as a vehicle for developing and providing agricultural knowledge, technology, materials, standards, and analysis that solves problems and supports innovation/progress in agricultural approaches and public health for governmental agencies, society, academic institutions, and commercial/private agricultural industries. ARS is expected to provide leadership in agricultural research, for USDA and other organizations. Our job is to maintain interaction with Congress. In doing so, ARS works with customers to develop a vision, identify problems, prioritize efforts, and mobilize resources.

Suppliers, Products/Services, and Customers/Stakeholders

ARS Suppliers	Products/Services	Customers/Stakeholders
Same as Customers and: Cooperators Other countries Vendors/Businesses Other Agencies The President	Problem Solving Knowledge and Technology (processes, practices, equipment, models) Materials: Germ-plasm Genes Micro-organisms Seeds Risk Assessments Chemical Standards	• Food and non-food industry • Other Fed Agencies (FDA, DOE) • Action and Regulatory Agencies (NRCS, APHIS, FAS) • Scientists (internal/external) • Farmers • Commodity Groups • Universities • USDA Secretary

Business Organization



Organizational Roles

Headquarters Staff Offices - Develop policies, provides support for decision making.

Area Offices, Locations, Laboratories, Management Units, Projects - Facilitate excellent research, collaborate and coordinate with external organizations, influence planning processes, supervision (recruitment, hiring, performance evaluations, reviews, training, prioritization, etc.) Between Areas - Coordinate through Administrator's council.

National Program Staff - Identifies problems, allocates resources, ensures program relevance, plans programs, coordinates programs and decides what research is done where.

Administrative and Financial Management - Establishes policy, provides consulting, planning, administrative and technology processing support.

Office of Technology Transfer -

International Research Programs -

Civil Rights -

Budget and Program Management Staff - Establishes policies, procedures, and systems essential to coordinate and effect a comprehensive Federal budgetary program, including the (1) Formulation of the President's budget; (2) Presentation activities to Executive offices and Legislative committees; (3) Execution of budget plans, appropriations and reimbursable accounts; and (4) Review and Reporting of programs, directives, and resources as implemented.

Critical Success Factors

The following are conditions or requirements critical for the success of ARS program management:

- Effective leadership and management team
- Reliable information
- Interrelated information and systems
- Clear problem identification
- A vision of where you are going
- Adequate people, resources, skills
- Competent scientists and technicians
- Appropriate facilities and equipment
- A communication process in place for all users and stakeholders at all levels of the organization.

- An effective way of telling people what we do (the value of what we do) P.R., marketing to ensure audience has a vested interest in agricultural research and issues, understanding of need.
- Compliance with Congressional intent and Federal mandates.
- Understand and be responsive to customer/stakeholder needs
- Deliver quality deliverables (Be the best!)
- A critical mass of scientific discipline
- Effective technology transfer and commercialization of research results
- Empower individuals and foster an environment conducive to creativity
- Get budget approved as submitted to Congress
- Accurate financial reporting and budgetary/financial analysis
- Relevant agency goals and research
- Communicating results effectively
- Build agency capacity

Goals and Strategies

The following are some general goals and strategies for ARS program management:

- State of the Art workforce
  - Quality of life for employees
  - Recruitment, retention, deletion
  - Training, retraining of workforce
  - High employee satisfaction
  - Leadership and management
  - Adequate facilities and equipment
  - Recognition, motivated workforce & rewards
- Effective technology transfer
- All users/stakeholders properly informed and part of process
- ARS properly informed by Stakeholders/customers
- Have interrelated information & systems that are up-to-date/current, accurate, pro-active, flexible. Common databases that users can pull out information for a specific use.
- A standardized (workable, user-friendly, flexible, common agreement) process for capturing, communication and dissemination information- both management and delivery.

Environmental Scan - External/Internal Drivers

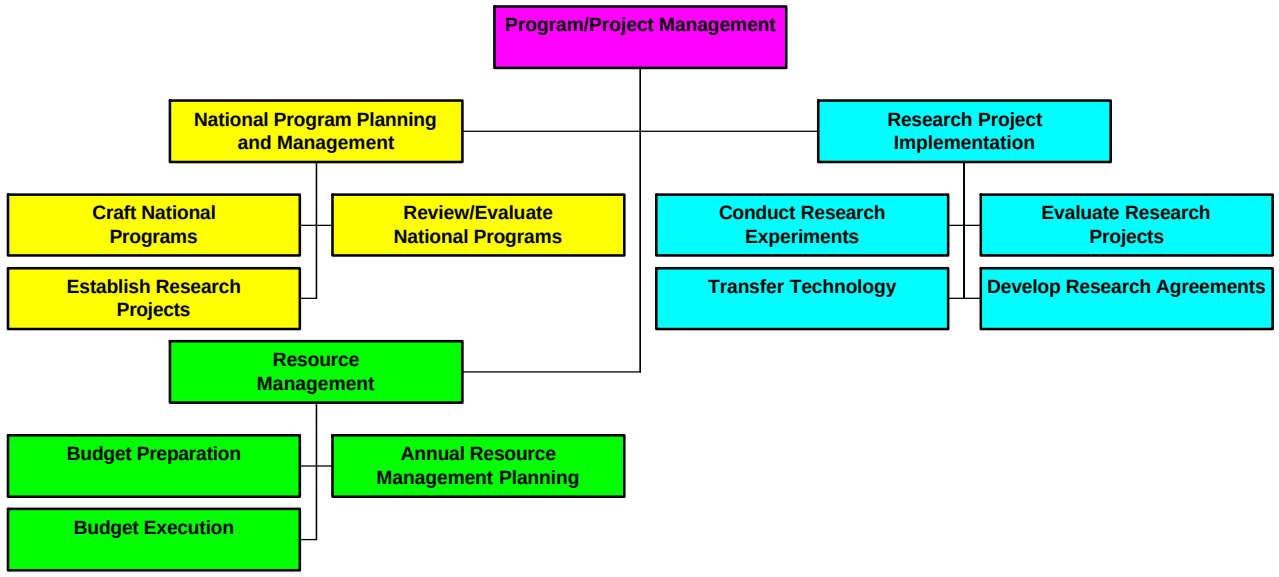
External and internal drivers of ARS program management.

External Drivers	
USDA mission requirements	Action & regulatory agencies - research needs - regulation, compliancy issues - safety and health
USDA Secretary pronouncements	Commodity groups
Congressional intent	Less production research (traditional)
Laws - Acts - (Food Quality Prot.)	Loss of agricultural land
GATT - NAFTA	Smaller #s of producers-bigger farms
Foreign policy	Low profitability of Agr. production
Diminishing political clout	Environmental Impacts(sustain ability and global change)
Emerging food pathogens	Shrinking resources
Emerging diseases	Competition to recruit
Biotechnology impacts	Computer technology (Internet)
Growing population	
Nutrition - consumer	
Market globalization	

Internal Drivers	
Management Philosophy and agenda (flux)	Downsizing - reduce overhead
Accountability (GPRA)	Increase Scientist Years (SYs) with static base with existing resources
High credibility with Congress	Targeted research thrust budget increases (not across the board)
Need to ensure relevance and quality of program	Diversity, discipline mix is changing
National Programs system (more centralized and interdisciplinary)	Flexibility of added responsibilities (changing jobs, training)
Customer-driven research is changing	Anxiety about job and resources
Identity of employees - University vs. ARS	Improve computer technology infrastructure
Workforce diversity	Improve condition of infrastructure (Facilities)
Aging workforce - retirements	

Overview of Major Program/Project Management Processes

The BAA business model of program/project management identifies three major functions performed to manage programs and achieve the mission of the agency:

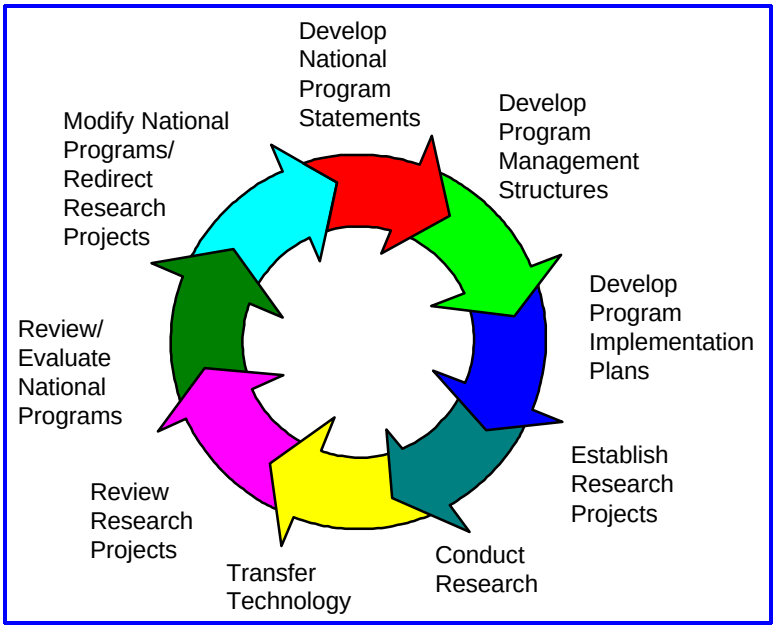


The basic activities performed for Program/Project Management can be represented in a life-cycle, beginning with the creation of National Program concepts and objectives and ending with the completion or evolution of a National Program. For one National Program, a program statement is developed in consultation with Agency customers and stakeholders identifying the major objectives, components, and expected outcomes of the program. A National Program team of scientists and program administrators develops a National Program implementation plan to further define the specific research objectives and performance measures for each component, the problems to be addressed through research, and the activities, time frames and resources to be applied to the National Program. Research project proposals (i.e. CRIS projects) are then developed to accomplish the National Program objectives, reviewed for merit, and then funded and resourced if approved. In this way, the research performed by the agency is guided and designed in accordance with the goals and objectives of National Programs.

Research activities are carried out amongst the National Program team (bench and field scientists, research leaders, etc,) and results are developed, shared, and unified into the National Program framework. Technologies developed through research are transferred to customers as research is conducted and completed. Each research project is periodically evaluated individually for progress and quality, and for relevancy and progress as part of a collection of projects within a National Program or National Program component. Each National Program is periodically reviewed and

evaluated for progress, accomplishments and for continued relevancy to contemporary agricultural research needs and issues. As external and internal changes in science and the environment occur, National Programs are modified and re-focused as needed and the National Program statements, implementation plans, and research projects are adjusted.

The agency communicates the intent and progress of the National Programs with customers and stakeholders throughout the life-cycle, and incorporates the objectives and strategies of the collective programs in the agency budget formulation process. The National Program framework becomes the predominant structure through which ARS communicates the objectives, accomplishments and impact of its research to customers and stakeholders.



The Basic Process Life-Cycle of Program/Project Management

Next Steps

Having completed the fundamental business model of the activities and information involved in Program/Project Management, ARS is now positioned to move forward in implementing new business processes, addressing needed process improvements for those identified by this project, and in developing a strategy to procure or develop key components of a new program management information system that supports the business requirements. In addition, the existing business model can be extended to incorporate additional business functions and information in moving toward enterprise system integration and modernization.

Next steps for continuing the BAA process fall into two categories:

- **Conceptual Business Model and Process Management**
- **Integrated Systems Support for Program/Project Management**

Conceptual Business Model and Process Management

There are four immediate tasks to undertake in improving upon and formalizing the business processes constituting the Program/Project Management business area:

1. Perform process improvements, redesigns, or more complete models for:
   - Peer Review Process for Research Projects
   - National Program Evaluation and Modification Process
   - Research Agreements Planning and Management
   - National Program Team formation and make-up

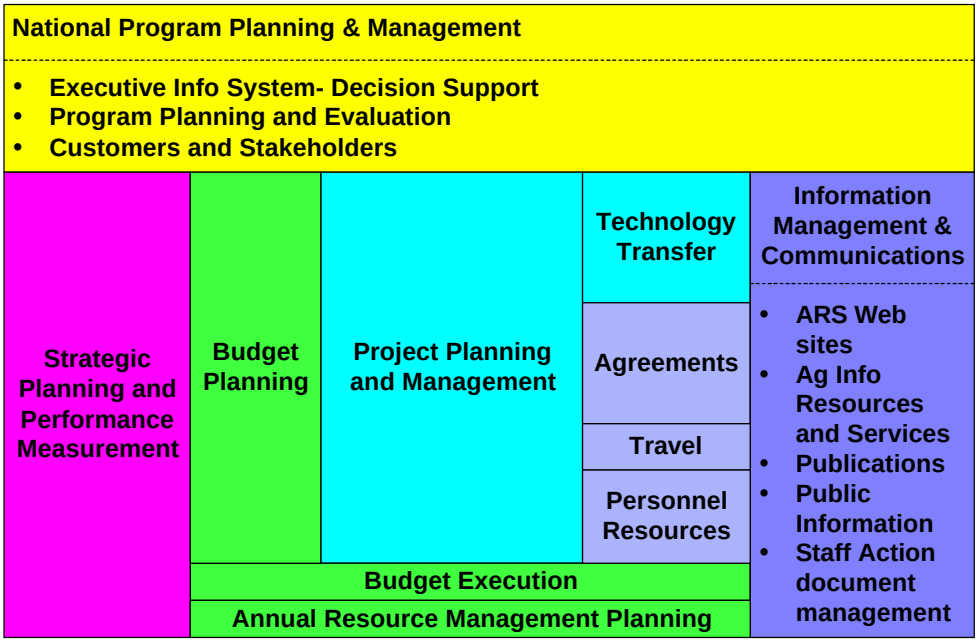
2. Achieve consensus for and verification of the business model developed from a broader and larger audience and Agency leadership. This can be achieved through facilitated workshops or presentations. This should be accomplished prior to any major investments in automated support for the business area.

3. Implement the complete business model once improvements are accomplished and consensus is achieved through policy, direction and training. New procedures should be communicated to agency personnel and managers.

4. Incorporate and expand upon the base model with additional functions and processes and/or additional information in the areas of:
   - Technology Transfer
   - Agreements
   - Resource Management - Staffing

Integrated Systems Support for Program/Project Management

Based on the business model developed for Program/Project Management, the core project team developed an initial concept for a new program management information system to support an integrated framework of business processes and information exchanges among them in the business area. The following graphic illustration of that concept conveys the key components or modules of the information system:



The core project team has identified and recommended the following actions to be taken in acquiring automated systems support for the Program/Project Management business area, in sequential order:

1. Conduct an initial survey of commercially or otherwise available information systems to determine if any is a candidate for possible adoption or modification for ARS use.

2. If an existing system is identified and determined a candidate for procurement or adaptation for ARS, proceed with formal processes for acquisition or procurement and implementation. If no existing systems are viable candidates for ARS use, proceed with investment analysis and project planning for in-house development of a new information system.

3. Depending upon the selection of an existing system or the determination to develop in-house, design and implement a strategy to train and develop ARS information technology staff in the tools and technologies to be used for the new system.

4. Acquisition or full-life-cycle development of the new program management system, based on a modular development and implementation approach.

Tasks, Time Frames and Resources

Recommendations for next step tasks, time frames and resources for Conceptual Business Model and Process Management and Integrated Systems Support are as follows:

Task	Time-frame	People	Dollars	
Conceptual Business Model and Process Management	**8 months**	**Dave Rust, Jenny Clouse co-leads**		
1. Process Improvements/re-designs	Aug. 98 - Dec. 98	Project team and support staff		
2. Consensus for business concepts	Dec. 98 - Jan. 99	Administrator's Council		
3. Implement business concepts	Feb. 99	Administrator's Council and NPS		
4. Incorporate/expand on related areas	Aug. 98 - March 99	Project team and support staff		
			estimated in-house salaries	$93,000
			travel/supplies	$8,000
			Subtotal	**$101,000**
Integrated Systems Support	**20 months +**	**Pamela Mason, Lead**		
1. Survey of commercial/other systems	Aug. 98 - Oct. 98	GSA-FEDSIM		
2. Planning and Investment Analysis - new system	Jan. 99 - Feb. 99	Mason and Consultant		
3. Train and develop IT team	July 98 - March 99	IT team and Technical Contractors		
	8 months			
			estimated contract costs	$135,000
			estimated in-house salaries	$46,400
4. Acquire or develop modular system	March 99 -	IT team and Technical Contractors		
			estimated contract cost - one year	$150,000
	1 year		*estimated salaries - one year*	$483,120
			Subtotal	**$814,520**
			Total	**$915,520**

Total estimated out-of-pocket costs:	$293,000
Total estimated in-house salary costs:	$622,520
	$915,520

Attachment E

USDA-ARS

Information Technology Management
An Information/Communication Strategy for National Programs

July 17, 1998
Final Report

By the

ARS Information Technology Management
National Programs Information Strategy Action Team

Claudia Weston, Chair,
and
Ray Carruthers, Sandy Hays, Bruce Kinzel, Pamela Mason, Lee Panella, Gail Poulos, and Dave Rust

Executive Summary

Information Technology Action Team # 5 (ITM 5) was charged with developing an overall strategy for communicating the National Programs to customers, stakeholders and ARS staff and integrating the related program elements utilizing electronic technologies. The resulting strategy would then be used to implement an integrated communication process whereby information related to ARS research activities would be made more accessible. This team developed a number of short term action items which it felt could and should be accomplished within a limited time frame. These action items included: establishing a National Program Staff web presence; soliciting feedback and comments on the National Program descriptions by alerting ARS' customers and stakeholders to the presence of these descriptions on the ARS web site; and, once the National Program descriptions were finalized, creating a brochure aimed at ARS staff outlining the new structure of the National Program Staff. Developing an integrated communication process whereby information related to ARS research activities would be made more accessible was identified as the sole long term action item.

Proposed activities related to this communication process were limited in scope to the creation of Internet-accessible resources made available through the ARS web site. These recommended resources focus on research activities from an ARS-wide perspective thereby enabling individual areas and locations to concentrate on the topics and concerns of their unique customer base. These resources include: predefined descriptions of ARS activities in terms of specific commodities (such as corn, potatoes, dairy products, etc.) or technologies (such as genetic engineering, pesticide reduction, etc.); matrices linking aspects of the National Programs to the actual research locations; a dynamic contact list of experts; responses to frequently asked questions (FAQs) and a section on hot topics; and a centralized access mechanism for Internet-accessible ARS-generated research publications, data, and information. The dynamic contact list of experts has already been developed and is available via the "Find the Expert" database located on the ARS web site.

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Note: Appendices available upon request.

Background

During the September Administrative Council (AC) meeting, the topic of information technology management in USDA and ARS was discussed and a number of action teams formed. Of these action teams, the fifth one was charged with developing an overall strategy for communicating the National Programs to customers, stakeholders and ARS staff and integrating the related program elements utilizing electronic technologies. This charge was modified slightly during the December AC meeting to limit the scope to include external customers only. The resulting strategy would then be used to implement an integrated communication process whereby information related to ARS research activities would be made more accessible. The original action team consisted of staff of the National Program Staff (NPS), Information Staff (IS), Office of Technology Transfer (OTT), Administrative and Financial Management (AFM), a field location (the Northern Plains Area (NPA)), and the National Agricultural Library (NAL) and included: Pamela Mason (NPS), Dave Rust (NPS), Ray Carruthers (NPS), Sandy Miller Hays (IS), Bruce Kinzel (OTT), Gail Poulos (OTT), Dave Carter (AFM), Lee Panella (NPA), and Claudia Weston (NAL) as chair.

A two pronged approach was taken to meet both the short term and long term external communication needs of the National Program Staff (NPS). To fulfill the short term needs, staff from NPS, IS, and NAL worked together to establish an NPS web presence. This web presence included descriptions of the National Programs and the "Find the Expert" database.

An announcement was sent to the Federal Register soliciting feedback on the new National Programs available for review on the ARS web site. Comments received continue to be distributed to the appropriate National Program teams for review and potential integration. Once the comment period has ended and subsequent revisions to the program statements are made, the IS will develop brochures aimed at ARS staff which will announce the new National Program Structure, address some of the frequently asked questions, and refer users to the NPS web site. Activities related to developing a long term strategy were held in abeyance until many of these short term activities were either well under way or completed.

At the first meeting of the full team, the charge of the action team was discussed and numerous background papers distributed. These papers included: a January 10, 1997 memo from G. Poulos and B. Kinzel, a January 17, 1997 memo from Ray Carruthers, and a February 4, 1997 memo from J. L. Hatfield concerning recommendations to and of the NPS Information Concept Working Group; October 1997 proposed models of ARS Internet data resources and a table of recommended action items with milestones from Pamela Mason; and information technology management in USDA and ARS handouts distributed by P. Andre at the September AC meeting. Other sources were identified and distributed to the team throughout the course of the project.

Vision and Mission of the Agricultural Research Service

Any initiative that requires a significant investment of resources should have a strong link to the vision and mission of the organization. Therefore, ARS' vision for "Leading America toward a better future through agricultural research and information" should be clearly visible through any strategic communication activity. This vision is supported through ARS' mission to "[c]onduct research to develop and transfer solutions to agricultural problems of high national priority and provides information access and dissemination to ensure high-quality, safe food, and other agricultural products, assess the nutritional needs of Americans, sustain a competitive agricultural economy, enhance the natural resource base and the environment, and provide economic opportunities for rural citizens, communities, and society as a whole." These roles of providing "information access and dissemination" and "transfer[ing] solutions to agricultural problems ..." are critical components of and the underlying premise beneath the overall Agricultural Research Service Communication Plan.

ARS Headquarters

Each of the background papers examined refers to a centralized repository as the authoritative source for information. This centralized source is seen as an internal working tool into and through which current and accurate program, budgetary, and administrative data are entered, viewed, manipulated, and extracted by authorized users. This repository also is seen as the source of information for externally focussed information products. ITM Action Team 4 who, in a more general sense, is charged with redesigning ARS program and resource management processes and systems also is charged with examining the nature and scope of this centralized repository.

The types of information products that can be gleaned from a centralized resource and that were identified as being of potential interest to ARS customers include: predefined descriptions of ARS activities in terms of specific commodities (such as corn, potatoes, dairy products, etc.) or technologies (such as genetic engineering, pesticide reduction, etc.) and matrices linking aspects of the National Programs to the actual research locations. Other information products of potential merit to ARS clients that should be managed centrally include: a dynamic contact list of experts; responses to frequently asked questions (FAQs) and a section on hot topics; and a centralized access mechanism for Internet-accessible ARS-generated research publications, data, and information. These products would be available via the ARS web site in a location determined by the ARS World Wide Web Board. They would serve as the organizational umbrella under which more detailed information could be obtained on specific research projects.

The data for the predefined commodity and technology descriptions and the National Program matrices could be extracted from the current Research Management Information System (RMIS) or redesigned centralized repository on an as needed or periodic basis. The frequency with which each of these products would be updated would be contingent upon the traditions of ARS administration and the messages the National Programs wish to communicate. The methods for updating the web site should be integrated as closely as possible into existing and/or revised processes and procedures for adding, deleting, or modifying program information.

The National Program Leaders (NPLs) would be the source of information for the contact list of experts, also known as the "Find the Expert" database. Personnel changes and shifts in program emphases would necessitate changes to the contact information. This update activity also could be done on an as needed basis or incorporated into a periodic review process.

The IS would be the logical source for FAQs and hot topics. Although the information reflected in these resources would be collected from many sources, some centralized level of oversight and coordination is needed to avoid duplication and to ensure the accuracy and currency of the information. A close relationship between IS and NPS would assure that relevant topics were being addressed. As these topics cool down, they should be archived and made accessible via a keyword and/or field delimited search facility.

Centralized Access Mechanism

At the September AC meeting, Lee Panella demonstrated a prototype web-based system created by the World Wide Web Agricultural Information Pilot Project Team (COWY Team) and designed to "facilitate subject access to work and accomplishments of current research units comprising the Colorado-Wyoming Research Council." At the heart of this system was a centralized database containing metadata records describing ARS-produced Internet-accessible resources. These resources ranged from computer models to research reports and publication lists. The demonstration also illustrated how an organized Web-based system could operate and the benefits of such a system to those attempting to locate information. The concept was well received by those in attendance with some voicing concern over the long-term support and funding of an ARS-wide implementation.

Many ARS locations already have made electronic resources available via their web sites. The key component that is presently lacking in the ARS web system is a centralized mechanism for accessing these resources. This mechanism could be developed either through the creation of a new automated administrative process or through the adaptation of an existing one.

Existing policies and procedures that could be adapted to develop a centralized point for accessing ARS-produced electronic resources are described in Directive 150.1 "Dissemination of Public Information by ARS," REE P&P 152-1 "Procedures for Publishing Manuscripts & Abstracts with Non-USDA Publishers (Outside Publishing)," and REE P&P 151.1 "Publishing (Print and Electronic)." These directives dictate the responsibilities and constraints of the various parties involved in disseminating ARS-related information as well as the approval process for this activity. They attempt to assure the quality of the information released to the public by ARS staff.

An integral component of the REE publishing policies and procedures is the creation of an ARS115 which tracks the publication approval process throughout the ARS organization. The RMIS system is used for the automated creation and modification of these forms and to facilitate the approval process. A by-product of these forms is the TEKTRAN database which includes

summaries “of recent research results” generated by ARS scientists and which is available both through RMIS (this version contains all the information submitted via the ARS115) and through the Internet-accessible TEKTRAN (this version contains a subset of the data submitted on the ARS 115) made available by the Technology Transfer Information Center (TTIC) at the National Agricultural Library. TEKTRAN is updated regularly to “includ[e] summaries of new articles that scientists have submitted for publication and remov[e] summaries after three years.” Mechanisms are also in place to protect potential patents by excluding related summaries from public view.

The Internet-accessible version of TEKTRAN has already proven to be a valuable resource for the public to obtain information on ARS-related research. Based on statistics gathered by NAL’s TTIC, TEKTRAN was accessed over 800,000 times in fiscal year 1997. The most popular topics, based on the ARS strategic planning code, included: pregnant and lactating women; pathogens and nematodes, nutrition; diseases; plant genetics and breeding; and naturally occurring toxic factors.

The relatively poor quality of Interpretive Summaries generated by ARS researchers for the ARS 115 and displayed in the TEKTRAN records was a source for concern by many. In order to increase the value of this database to ARS’ customers, serious consideration should be given to improve the quality of the records and the nature of the summaries. While addressing the data quality issue, the data elements should be reviewed to determine their compliance with existing and emerging metadata standards. These include the Dublin Core, those proposed in the REE Information System (REEIS), and the NBII (National Biological Information Infrastructure). If the scope of this database is expanded to include other electronic resources (such as databases) made available by ARS researchers via the Internet, then other standards such as GILS (Government Information Locator Service) also should be examined.

The benefits to adapting the present ARS 115 approval process and the resulting TEKTRAN database include: 1) internal ARS procedures for submitting data already exist and could be modified, if necessary; 2) the existing TEKTRAN data elements closely resemble a subset of those recommended by the COWY Team (i.e., *Authors* in TEKTRAN - *Investigators* in the recommended COWY database, *Interpretive Summary* in TEKTRAN - *Description* in COWY, *Keywords* in TEKTRAN - *Keywords* in COWY, etc.) and those in other existing and emerging metadata standards; and 3) review mechanisms already exist and could be strengthened to improve the meaningfulness of the data to ARS customers.

The creation of a centralized access mechanism can be achieved using any of three system models. These models are best described as centralized, hybrid, and decentralized. In a centralized system, both the metadata (one possible definition of the term “metadata” is: records describing a resource) and the electronic resources described by the metadata reside on and can be accessed from a centralized repository. Within a hybrid system, the metadata records reside on and can be accessed from a centralized repository but they link to and serve as access mechanisms for resources located on servers throughout the system. A decentralized system relies on search and

retrieval programs and scripts accessed through the centralized server which search metadata and/or data residing on disparate servers throughout the system.

The Centralized System

Using this model, all metadata and electronic resources would reside within a centralized server. The Staff Action system used by the Office of the Executive Secretariat for controlled correspondence is an example of this model. Images of the incoming correspondence, their descriptions, routing information, and the resulting responses are all accessible via a centralized system. Given sufficient storage and computing power, this model could be adapted for electronic publications via a re-engineered RMIS system. In addition to modifying the data elements within the ARS115 and improving the quality control process for the data, a carefully orchestrated and labor intensive effort would need to be undertaken to identify, obtain, load and centrally manage these electronic resources.

The Hybrid System

Within a hybrid system, metadata records reside on and can be accessed from a centralized repository and serve as access mechanisms for resources located on disparate systems. This approach could be adapted relatively quickly through modification of the present ARS115 requirements by asking the researcher to supply URLs (Uniform Resource Locator) for resources they have made accessible via the WWW. These URLs could be added to each field in the ARS115 for which additional information could be obtained from an ARS web site. Once the data are extracted from RMIS and loaded into the TTIC Internet-accessible TEKTRAN, the URLs could be activated so that the customer would be able to navigate to that resource without human intervention. The Area Offices would be responsible for assisting those locations without the necessary resources in making their publications Internet-accessible.

The Decentralized System

The Internet as a whole can be viewed as one large decentralized system from which search engines such as Alta Vista and OpenText glean information. Despite numerous initiatives, obtaining relevant high-quality information in such an uncontrolled environment has proven to be extraordinarily difficult. There exist, however, much more controlled decentralized systems which could serve as a model for ARS. One such system, the NASA Image eXchange (NIX) System (www.nix.gov), searches about 400,000 photos and data images from seven NASA Centers. The images and their descriptions reside on servers located at the geographically dispersed centers. Once a customer has initiated the search, it is sent simultaneously to each server. The results of the search are then returned from each server to the originating source, sorted and ranked, and made available to the searcher. NASA views the Image eXchange as the first step toward a comprehensive decentralized online imagery collection, and other collections will be added as they become available.

In order to implement an ARS-wide system using this model, each Area or other designated location would be responsible for developing and maintaining the system which would store and provide access to the publications produced within their jurisdiction. Each site could have its own

search and retrieval software as long as the data and/or metadata were stored in a format accessible via a centralized retrieval package. The centralized search mechanism would be prominently accessible via the ARS web site.

System Recommendation

In reviewing the present organizational structure and the state of technology within ARS, the implementation of a hybrid system appears to be the most cost effective and practical solution for increasing access to ARS information via the Internet. The modifications to the ARS115 should be an integral part of the RMIS re-design process and should be included as soon as possible. Some short term actions could be taken (such as adding URLs to data elements reflecting existing Internet accessible resources) while longer term redesign measures are being considered and implemented.

Summary of Action Item Recommendations and Activities

1. Post National Program Statements on ARS website for customer and stakeholder review. (Done)
2. Distribute letters to customer and stakeholders requesting review of statements. (Done)
3. Send announcement of the availability of the program statements via the ARS web site to Federal Register. (Done)
4. Create and disseminate brochures describing National Program Structure. (Pending)
5. Develop predefined commodity and technology descriptions for inclusion on ARS web site. (Recommendation)
6. Develop a dynamic contact list of experts for inclusion on ARS web site. (Done& Ongoing)
7. Develop a section for hot topics and responses to frequently asked questions (FAQs) for inclusion on ARS web site. Archive these as topics grow outdated. (Recommendation)
8. Develop a centralized access mechanism for Internet-accessible ARS publications and information based on the ARS115 process. Include modifications to this process in the RMIS redesign activities. Headquarters would be responsible for the centralized metadata repository and the ARS Area Offices would coordinate the posting of publications on the Internet for their respective locations. (Recommendation)

Appendix A
Schedule & Milestones

Task	Target Date	Actual Date
Charge & Background Material to Committee	Oct. 27, 1997	Oct. 27, 1997
Establish an NPS Web Presence	Dec. 19, 1997	Feb. 20, 1998
Distribute letters to stakeholders requesting review of statements	Dec. 19, 1997	Mar. 13, 1998
Send brief announcement of website to Federal Register	mid-Mar.1998	
Begin drafting long-range plan	Jan. 5, 1998	
Complete stakeholder evaluation period	Apr. 30, 1998	
Create and disseminate brochure and information packets	mid-June 1998	
National Program Teams complete review and finalize statements	end of May 1998	
Submit long-range plan	Apr. 30, 1998	

Time frame 6 months: 10/97 - 4/98
Proposed Budget: $5,000.00

Appendix B
Background Material

Attachment F

FINAL REPORT - Action Team 6
August 27, 1998

Research Information Needs

Executive Summary

The Research Information Needs Team is one of 6 Action Teams developed as a result of the Information Technology Moratorium and formation of the ARS Information Technology Management Committee co-chaired by Pam André and Ed Knipling.

The Research Information Needs Action Team 6 was formed and envisioned to be a scientist' driven study of research information needs. The purpose of the Action Team 6 was to determine how best to meet the information needs of ARS researchers at a reasonable cost.

Internet Connectivity, E-mail, File Transfer, Video and Audio Conferencing Intranets: An online Information Technology Needs Agency-Wide Survey of ARS scientists was conducted through the Internet on the Current Information Technology abilities and future needs, of which 868 scientists responded. Major conclusions were that the majority of ARS scientists have access to the Internet and most are satisfied with the speed of connection. They have excellent computer resources, most with Pentium processors indicating that they would have very good access to e-mail, file transfer, Intranets and literature databases.

Respondents suggested a need for better computer hardware and software support, a centralized "help desk" to answer computer questions, and convert the traditional secretarial positions into computer support/information technology specialists. Survey results suggested ARS scientists could fully utilize on-line desktop access on-line.

Online Support For Grant Seeking and Grant Deadlines: More than half of the respondents felt they had adequate access to extramural grant information, and obtained that information from a variety of sources including direct mailings, granting agency web pages, university grants support offices, and networking with colleagues. The narrative responses suggest that in-house grant information support to scientists is fragmented.

Because most of ARS research has traditionally been centrally funded, a move toward expecting partial support through grants would constitute a major cultural change for the Agency and many of its scientists. For scientists to become effective in obtaining extramural funds, there needs to be some Agency support . An ARS Unit analogous to the sponsored programs offices at major research universities could provide this service.

Action Team 6 recommends that an Extramural Funds Support Office be established to demonstrate support for, and encourage seeking of, extramural funding for ARS research when and where appropriate. This would serve to consolidate fragmented efforts to provide fund seeking information to scientists, and ultimately should improve the percentage of proposals submitted receiving awards through the coordination of training on grantsmanship, providing timely information on deadlines, and assisting fund seeks with the process. We suggest that the office should have one FTE and some shared clerical and webmaster support, reside within the National Program Staff, and should coordinate closely with the Office of Technology Transfer and Technology Transfer Coordinators, the Extramural

Agreements Division of AFM, Area Offices, and the CIO (proposed Chief Information Officer).

Current Awareness, Retrospective Searches and Document Delivery: A study of the utilization Current Awareness service provided by NAL indicates it is possible to improve service at a much reduced cost. The Current Awareness Literature Service (CALS) provided by the National Agricultural Library (NAL) provides lists of publications relevant to the scientist's needs. The survey suggests that currently 12.4% of the respondents rely solely on CALS for computer literature searches. Since its inception, a number of studies have been conducted on the effectiveness of CALS and on identifying other resources used by ARS staff to obtain information on current research literature. These studies, one dating as far back as 1988, reflect both the need for mediated searches conducted by information professionals as well as the desire on the part of some researchers to conduct their own searches. This need was reaffirmed in a 1998 survey of research information needs conducted by the ARS Research Information Needs Action Team 6.

ARS and non-ARS USDA researchers and information professionals have used Current Contents since it became available in the late 1950's. It has been used to augment or to substitute for CALS since CALS became available as an established service. Initially available only in print, Current Contents is now available in a variety of formats (print, diskette, CD-ROM, and through the World Wide Web). Subscribing to "Current Contents Connect" builds on the widespread use of the Internet and the World Wide Web by the ARS and non-ARS USDA community as a mechanism for obtaining and delivering information. Through this service, desktop web-access would be provided to ARS administrators, researchers, and information professionals for articles found within the most highly regarded journal literature. Augmenting "Current Contents Connect" with the CD-ROM version of Current Contents for NAL would enable CALS staff to continue to provide the current service to its customers. CALS staff would work with its customers to modify, establish, and/or delete search profiles; run these profiles against updates of the CD-ROM; and then would disseminate the results electronically to individual customers. This service would meet the needs of the ARS and non-ARS USDA community who, because of other commitments, time constraints, or preferences, cannot conduct searches themselves.

Action 6 Team recommends providing "Current Contents Connect" via the web to users, while continuing the CALS services offered through NAL using Current Contents on CD-ROM.

Submitted By:
Action Team 6 Members:

Keith Anderson
Andy Hammond
Stuart Hardegree
Steve Helmrich
Ed King
Laura McConnell
Bob Silva
Dick Soper (Chair)
Claudia Weston

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Attachments:
1) Final Reports - 3 Subcommittees
2) Survey - Results Agency Summary
3) Survey Results by Area

Final Report
Subcommittee on Internet Connectivity, E-mail, File Transfer, Video and Audio Conferencing, Intranets

Laura McConnell and Bob Silva

One of the objectives of the Research Information Needs Action Team was to assess the Internet connectivity level of ARS scientists. In addition, the Team wanted to determine how scientists were using the Internet and how ARS could improve scientist's access and utilization of this important tool. The following is a summary of the results from an agency-wide survey of all ARS scientists conducting during June and July of 1998. The survey was posted on the Internet. Even though paper copies of the survey were made available, most scientists responded using the on-line form. Therefore, the results of the survey may be somewhat biased towards those scientists that have relatively easy access to the Internet.

Internet Access:

Of those persons responding to the survey, 99.1% of scientists currently have access to the Internet and 75% of those are satisfied with the speed of their Internet access. This figure was surprisingly high. This indicates that ARS scientists have definitely moved into the information age and are utilizing the tools and communication options available through the Internet. Over 90% of scientists use the Internet for e-mail and world-wide-web (WWW) access. Other uses were file-transfer-protocol (FTP), 37%, Telnet, 34%, newsgroups, 26%, gopher, 21%, as well as list serves, search engines, on-line literature searches, and professional society information. Scientists generally spend between 1 and 3 hours per week utilizing the Internet, 23% of scientists spend 3-5 hours, and a smaller percentage ~10% spend more than 5 hours per week. A question was included on the survey to gauge the interest in Internet2. Forty-eight percent of scientists responded that they would be interested in Internet2, and most of those that were interested stated that they could utilize this tool for different types of modeling and creating specialized graphical images.

Another perhaps surprising result is that only 31% of ARS scientists have a USDA e-mail account. Forty-one percent have a university account, 5% have an other federal, state or local government account, and 7.5% have a commercial account. This high percentage of university accounts is representative of the strong ties between ARS and universities. The .edu account can also give ARS scientists access to special services from the university such as on-line databases for literature searches, homepage services, grants information, and document delivery.

Twelve percent of scientists are connected to the Internet through a modem. The speed of modems listed was in general at the high end of commercially available modems (>14.4 KB). Conducting literature searches and downloading large files via modem, however, can be a slow and tedious process. Results of the survey, however, appears to indicate that a large number of scientists now have a high speed connection to the Internet required for efficient utilization of on-line databases and search engines.

Only 20% of scientists pay for Internet access. Of those paying for Interent access most listed a cost of approximately $15-$20 per month with others listing much higher values of $200-

$500 per month presumably for an entire lab or unit. Other scientists listed the cost as part of their indirect research costs. One third of all scientists responding to the survey did not know if they were paying for Internet access with the remaining 48% stating that they did not pay for access.

Computer Resources:

ARS scientists appear to have excellent computer resources. 96% of ARS scientists have a computer at their desk. They overwhelmingly use the Windows95 operating system (77%) with only 10% using Macintosh systems. Most scientists use their computers primarily for word processing, data analysis, e-mail and other Internet activities, graphics, database management, literature searches, statistical analysis, and modeling. Other more unique uses are: monitoring control systems, time management, homepage management, and remote access to dataloggers in the field.

Seventy-seven percent of scientists have Pentium processors generally with >= 32 MB of RAM memory, 44% of those Pentium processors have a microprocessor speed of 90-166 MHZ and 27% have a speed of 200-266 MHZ. Most scientists, 49%, have a hard drive of 1-3 Gigabytes and 18% have 3-6 Gigabytes of space. Overall, 68% of ARS scientists are satisfied with their computer resources and support at their location. Those that were unhappy with their computer resources were asked what ARS could do to improve resources and support. A large number of the answers were a request for better computer hardware and software support. Specific suggestions that were repeated by respondents were for: a centralized "help desk" to answer computer questions, for converting the traditional secretarial positions into computer support/information technology specialists, providing specialists to help with computer upgrades and network management as well as software upgrades and training, and more funding for upgrading computer resources.

The results of this survey suggest that ARS scientists could fully utilize on-line, desktop access to a quality current awareness literature database as proposed by this committee.

Final Report
Subcommittee on Online Support for Extramural Fund Seeking and Grant Deadline Information

Andy Hammond (Stuart Hardegree), Steve Helmrich

The purpose of the Action Team 6 is to determine how best to meet the information needs of ARS researchers at a reasonable cost. The team will be expected to identify information needs, explore options and costs of electronic resources and recommend an appropriate system or service.

Status and Current Situation:

The information technology needs survey conducted by Action Team 6 contained two questions related to support for extramural fund seeking and grant deadline information. These questions and the survey results are given below.

"Do you feel you have adequate access to extramural grant information?"

Yes	61.8%
No	27.4%
Didn't answer	2.4%

"How do you obtain information regarding grant availability and deadlines?"

Mailings only	56.0%
Grant agency web pages	42.7%
University office of grant support	33.3%
Other (see appendix Q15)	

More than half of the respondents felt they had adequate access to grant information and obtained that information from a variety of sources including direct mailings, granting agency web pages, university grants support offices, and networking with colleagues. However, narrative responses to "question 15-other" and "question 30" suggest that in-house grant information support to scientists is fragmented coming from some Area offices or Centers but not all, coming from some Technology Transfer Coordinators but not all, and some being passed on to scientists by research leaders but not all. Some respondents did not feel that seeking outside funds was allowed or encouraged and some indicated that they did not engage in this activity. There were suggestions that ARS needs a grant support office to serve as a centralized source of information and support in seeking extramural funds. Alternatively, there was one suggestion that these functions were being handled by individual program units or by the scientists themselves and that ARS need not alter this system.

Because most of ARS research has traditionally been supported through the budget process, a move toward expecting partial support to come from outside sources would constitute a major cultural change for the Agency and many of its scientists. For ARS to become more effective in seeking and winning extramural funds, there needs to be some Agency support for assisting scientists avail of resources, become skilled at grant writing, and deal with the

process. An ARS unit analogous to the sponsored programs offices at major research universities could provide this service.

Options:

1. No change in Agency practice of encouraging extramural fund seeking when appropriate with reliance on area offices, program units, and individual scientists to obtain and disseminate information on availability of extramural fund programs.

   - The advantage of this option is that no action is required.
   - A disadvantage is that the cultural change toward pursuit of extramural funds to enhance base funded research will not be encouraged.
   - Another disadvantage will be that efforts to provide information on extramural fund seeking will remain piecemeal, fragmented, duplicative and inefficient.

2. Expand the function of the Office of Technology Transfer and expand the duties of Technology Transfer Coordinators to include support to scientists seeking extramural funds.

   - Advantages of this option are that it takes advantage of existing agency structure and could be accomplished within current funding levels.
   - Disadvantages would be that redirection of effort within OTT would detract from its mission and diminish the ability of Technology Transfer Coordinators to carry out their current charge and duties.

3. Create a new unit or office to support scientists seeking extramural funds.

   - A major advantage of this option is that it would demonstrate support for and encourage seeking of extramural funding for ARS research when and where appropriate.
   - Another major advantage of this option is that it would serve to consolidate fragmented efforts to provide fund seeking information to scientists. The quality and comprehensiveness of information should be improved as well.
   - A further advantage would be to improve the percentage of submitted proposals receiving awards through the coordination of training on grantsmanship, providing timely information on deadlines, and assisting fund seekers with the process.
   - The main disadvantage would be that new funding would be required to support this effort. A rough estimate of funding required would be $100,000 per year.

Recommendations:

The Action Team recommends that an extramural funds support office be established. Additional functions of this office should be assisting scientists to become skilled at grant writing and dealing with the pre and post award process. It is envisioned that this office could function with one FTE and some shared clerical and webmaster support. This office should reside within the National Program Staff and should coordinate closely with the Office of Technology Transfer and Technology Transfer Coordinators, the Extramural Agreements Division of AFM, Area Offices, and the CIO (proposed Chief Information Officer).

Final Report
Subcommittee on Current Awareness,
Retrospective Searches and Document Delivery

Stuart Hardegree, Claudia Weston, Steve Helmrich

Status and Current Situation:

Maintaining awareness of the literature is an essential element in the research program of every ARS scientist. ARS currently maintains a Current Awareness Literature Service (CALS) that is operated by the National Agricultural Library (NAL) and is available to all ARS scientists. NAL currently provides CALS service to approximately 1,000 USDA employees, 87% of whom are affiliated with ARS. The current CALS databases include: AGRICOLA, Aquatic Sciences and Fisheries Abstracts, Biological Abstracts, Chemical Abstracts, CAB Abstracts, Engineering Index, Food Science and Technology Abstracts, Government Reports Announcements, Life Sciences Collection, Water Resources Abstracts, World Textile Abstracts, and Zoological Record. NAL currently contracts with Knight Ridder to provide access to these databases through it's Dialog Alerts service. This service is based on actual number of searches requested which amounted to approximately 3600 per month in FY98. The CALS system currently costs USDA $976,000 per year, $800,000 of which is attributable to ARS. Of the total cost of CALS, approximately $200,000 per year goes to personnel and administrative costs and $800,000 into the cost of licensing access to the database.

Although the CALS system is available to all ARS scientists, it is used by less than half. Over half of ARS management units purchase other database products and services and many utilize university library resources for their current awareness needs. The ARS office of Administrative and Financial Management estimates that individual management units and regional research centers are currently spending over $250,000 per year on alternative current awareness services.

In 1997, a survey was conducted to evaluate CALS performance and use and it was determined that this system should be reassessed to determine the most cost effective way of providing for the current-awareness needs of ARS scientists. The Information Technology Management (ITM) Action Team 6 was asked to assess ARS information technology needs and to provide policy recommendations regarding information technology services that would be provided by headquarters.

In July, 1998, the ITM Action Team 6 conducted a survey of ARS scientists to determine current status, capabilities and needs regarding information technology. The following is a summary of survey results pertaining to current awareness, retrospective literature searches and document delivery. The full survey results are appended to this report.

- Technology for electronic access to information does not seem to be a problem within ARS. Almost all survey respondents have access to the Internet (99%) and the majority have relatively state-of-the-art computers at their desk (96%).

- Forty-four percent of survey respondents utilize CALS. Of this group, most (69%) find that

the current service is always or frequently useful. Over 75% share their CALS results with others. Seventy-nine % of current users would not continue subscribing to the CALS service if the cost were as much as $100 to $500 per year per client.

- Even with access to the CALS system, 76% of survey respondents indicated that they also conduct their own computer literature searches. These alternative search services include free (38%) and commercial (21%) services on the Internet, commercial products on disk and CD-ROM (32%), university library resources (43%), and other services offered by NAL (34.7%).

- Most Survey respondents also use journal subscriptions (81%) and 49% browse library stacks to keep up on the literature.

- Thirty-one percent of Survey respondents require immediate knowledge of new publications. An additional 44% monitor the literature and maintain a list of publications in their field but could tolerate a delay in current awareness of 2-3 months.

- Seventy-four percent of Survey respondents feel that their current awareness search methods are frequently or always adequate for their needs.

- Some common suggestions for improving current awareness capabilities include:
  Easier access to databases.
  On-line capability for conducting personal searches.
  Improved information regarding availability of products and services.
  Training.

- Sixty-nine percent of Survey respondents indicated that they are satisfied with current capabilities for conducting retrospective literature searches. Suggestions for improvement were similar to those for improving current awareness: easier access, information on product and service availability and training.

- Most ARS scientist obtain reprints and other documents from libraries (75%), the NAL document delivery service (50%) or by requests directly to authors (48%). Seventy-four percent of scientists indicated that they were satisfied with their current access to documents.

- The NAL document delivery service was found to be extremely valuable, especially to locations that are not located near a research library. There were some suggestions that this system could be streamlined somewhat to make it easer to submit reprint requests.

- Sixty-nine percent of survey respondents are affiliated with a college or university that entitles them to access to library resources. Of this group, many have access to on-line databases, library reference services and CD-ROM products at no cost. Document delivery or copying services at these institutions, if available, is generally not free. Sixty-seven percent of those affiliated with a college or university have very easy or somewhat easy access to a research library.

- Only 55% of respondents maintain a personal computer database of relevant literature citations. Of this group, about 40% use software specifically designed for maintaining a

reference database. The remainder mostly use word-processing and spreadsheet software.

- Many respondents expressed strong support for the CALS system and would like to see it maintained. Many others have sought out alternative methods of maintaining current awareness either because they were unaware of CALS or preferred to use other commercial or free products and services. Many respondents requested more information on CALS and other alternative services.

Options:

Based on survey responses and input from Action Team members, six options were proposed for ARS current awareness options:

1. Eliminate CALS Service.

   - Cost savings of $800,000 per year to ARS
   - Shifts cost of current awareness to management units
   - Eliminates primary current awareness procedure for many ARS scientists
   - Puts unequal burden on management units at remote locations and/or locations that are not affiliated with a university research library

2. Maintain CALS in it's current form.

   - Currently costs $800,000 per year and increases every year
   - Depending upon the cost of the database, limits are placed on the number of citations one can retrieve per search. The average search is limited to 50 hits that are not based upon relevancy to search criteria
   - Does not allow individual scientists to personally conduct search

3. Maintain CALS but replace the current Dialog/Knight Ridder database with Current Contents on CD and the AGRICOLA database.

   - Estimate cost savings of $600,000 per year over current database
   - Search profiles based on keywords rather than search codes
   - Would record and pass on all search "hits"
   - Database would derive from journal title pages, abstracts and keywords and covers a very large number of periodicals
   - Database would lose capabilities for searching patent records and some government publications

4. Eliminate CALS but provide Current Contents Connect to all ARS scientists.
   cost savings of option 1

   - Would still provide a current awareness search capability to all ARS scientists
   - Full scientist control over search parameters and search frequency
   - Automatic generation of reprint requests and reference database content
   - Requires individual scientist training

- Requires individual facility with program software and use of the Internet
- Would reduce current cost to management units for current awareness products

7. Maintain CALS in it's current form but also provide Current Contents Connect to all ARS scientists.

   - All of the advantages of options 2 and 4
   - Disadvantage of high cost of option 2 and additional cost of option 4

8. Maintain CALS but switch to Current Contents on CD database and also provide Current Contents Connect to all ARS scientists.

   - All of the advantages of option 3
   - All of the advantages of option 4
   - Considerable cost savings overall but with expanded services
   - Reduction in access to patent information and some government publications

RECOMMENDATIONS

Current Awareness:

The Action Team recommends Option 6. Under this option, CALS would continue but with improved services and lower cost and increased flexibility. The office of Administrative and Financial Management estimates that CALS database costs can be reduced by approximately $600,000 per year by switching to Current Contents on CD. The cost of obtaining Current Contents Connect for every ARS scientist is estimated to be approximately $160,000 per year. It is also estimated that ARS management units currently spend over $250,000 per year on current awareness software that would no longer be purchased when Current Contents Connect is made available. The proposed system is also compatible with commercial literature database software and can be used to generate reprint requests directly from the authors. Current CALS users will continue to get existing services but there will no longer be a limit on the number of database "hits" that are recorded and sent to a given scientist.

Disadvantages of this option are that some disruption of services will occur when the transition takes place. CALS keyword-search profiles will have to be reconstructed to make them compatible with the new database. Scientists that choose to use Current Contents Connect will have to go through a period of training. Differences also exist between the current and proposed databases and some information sources may no longer be accessible by the search engines.

Retrospective Searches:

NAL staff currently conduct retrospective searches for ARS scientists upon request. Retrospective searches are also available to many research units that are affiliated with a university research library. The Action Team does not feel that any changes in retrospective-search policy or capabilities are warranted at this time. The ARS Libraries-2000 committee has been asked to address the current status and future needs for these products and services and will have access to all of the data generated by the ITM survey regarding this issue. The ARS Action Team recommends that ARS encourage management units to take

advantage of free search services at affiliated university libraries in order to reduce the administrative burden on NAL.

Document Delivery:

NAL currently provides a document delivery service for ARS scientists. The Action Team recommends, however, that individual management units be encouraged to request reprints directly from authors as part of their current awareness strategy. Reprint requests are relatively easy to generate with the Current Contents software proposed under Option 6. The Action Team also recommends that scientists take advantage of resources available at affiliated research libraries if they are easily accessible.

Attachment G

ARS Chief Information Officer

Responsibility

The CIO is responsible for ARS-wide information technology policy and management, focusing on agencywide information data management, communications systems, evaluation of technology, and compliance with Federal statutes, including system and information security. The CIO will represent ARS IT issues to the Department, serve as a catalyst for design and implementation of new and innovative organizational IT capabilities, and communicate, both internally and externally, the role of information systems in program delivery, information resources, and mission support.

Organizational Placement

The ARS CIO will be a senior executive (SES), report to the ARS Administrator, and function as an equal partner with other senior officials in decisionmaking with regard to information technology policy and issues. The CIO will be a member of the Administrator's Council.

Duties

a. Establish ARS-wide Information Technology policies to promote the effective use of IT in support of the research mission.

b. Develop ARS-wide IT plans and the IT budget (for example, strategic IT plan, capital planning and investment control, support for Information Technology Investment Review Board). Manage the implementation of these IT plans and budgets.

c. Represent ARS within the USDA and Federal IT communities.

d. Develop policies and standards for the electronic dissemination of ARS information through ARS websites (including the ARS webmaster role).

e. Oversee the development, enhancement, and maintenance of business, data, and technical information systems.

f. Manage, operate, and enhance agencywide IT infrastructure components (for example, telecommunications, information security).

g. Develop appropriate IT standards for use in both program and administrative units.

h. Define standard methods to be used ARS-wide for structured analyses of ARS processes and information needs (for example, business area analyses). Define project management standards and methodologies to be used for major IT projects. Oversee the conduct of these major projects.

i. Serve as the ARS Year 2000 Executive Sponsor and oversee the Year 2000 compliance effort.

j. Conduct research and analysis of emerging information technologies that can enhance both the conduct of research and the delivery of research results to ARS customers.

k. Oversee and coordinate the operation of ARS IT units.

l. Develop and implement an IT education and training program to establish and maintain core competencies among ARS managers, technical staff, and information technology users.

CIO Office Structure

The CIO will supervise a professional and technical staff that will provide program and policy oversight and technical expertise for agencywide information systems. The focus will be in four areas: communications, policies and procedures, IT security, and innovative uses of IT in the research mission.

Attachment H

Information Technology Management Transition Team

With the proposed sunset of the ITM Steering Committee on September 30,1998, the steering committee recommends establishment of an Information Technology Management Transition Team to ensure that ARS continues to progress in efforts to improve management of information technology in support of our research and information mission.

Charge

The purpose of the Information Technology Management Transition Team is to guide implementation of agencywide information policy and to provide a strategy for effective information management during an interim period until the ARS Chief Information Officer (CIO) office is operational.

Proposed Membership

Pam André
Keith Anderson
Will Blackburn
Anna Hewings
NPS Representative
Research Scientist

It is anticipated that others will be called upon as necessary to facilitate interim activities.

Tasks

- Assist with recruitment of a CIO
- Assist with establishment of the CIO's office
- Provide oversight of short term budget requests and acquisitions as recommended by the Information Technology Management Steering Committee Report (for example, new contracts for CALS).
- Provide guidance and monitoring of progress on Team 4 action plan (replacement of the Research Management Information System).
- Provide other guidance and oversight as necessary to ensure an effective transition.
- Organize an AC Retreat on Information Technology Management.

Attachment I

GAO Best Practices

1. Recognize and communicate the urgency to change information management practices.
2. Get line management involved and create ownership.
3. Take action and maintain momentum.
4. Anchor strategic planning in customer needs and mission goals.
5. Measure the performance of key mission delivery processes.
6. Focus on process improvement in the context of an architecture.
7. Manage information systems projects as investments.
8. Integrate the planning, budgeting, and evaluation processes.
9. Establish customer/supplier relationships between line and information management professionals.
10. Position a Chief Information Officer as a senior management partner.
11. Upgrade skills and knowledge of line and information management professionals.

ARS Information Technology Management Steering Committee

Charter

The purpose of the Information Technology Management Steering Committee is to guide the establishment of agency-wide information policy and a strategy for effective information management.

Bob Reginato, Co-chair

Pam André, Co-chair

Will Blackburn

Ruth Coy

Steve Edney

George Foster

Wiz Horner

Peter Johnsen

Jean Steiner

Tom Walton

Attachment K

Summary of the ARS Information Technology Management Self-Assessment

Introduction

On April 8 and 9, 1997, the ARS Information Technology Management Steering Committee conducted a self-assessment of ARS's management of its information technology resources. The purpose of the assessment was to identify issues needing greater attention and develop action plans to address those issues.

Participants

The members of the ITM Steering Committee carried out the self-assessment in a 2-day facilitated session. The members of the committee for this session were:

Bob Reginato
Associate Administrator
Washington, DC

Pamela André
Director
National Agricultural Library

Will Blackburn
Area Director
Ft. Collins, CO

Ruth Coy, Branch Chief
Information Staff
Greenbelt, MD

Steve Edney
Area Administrative Officer
Peoria, IL

George Foster
Acting Associate Area Director
College Station, TX

Wiz Horner
Associate Deputy Administrator, AFM
Greenbelt, MD

Peter Johnsen
Director, National Center for
Agricultural Utilization Research
Peoria, IL

Jean Steiner
Research Leader
Watkinsville, GA

Tom Walton
Director, National Animal Disease
Center
Ames, IA

Process

The ITM Steering Committee hired a contractor, Coopers and Lybrand, to facilitate the self-assessment using GAO's Strategic Information Management (SIM) Self-Assessment Toolkit. GAO developed the assessment tool based on case study research of the SIM practices of senior management teams in leading organizations. GAO identified 11 best practices that the senior managers in these leading organizations used:

1. Recognize and communicate the urgency to change information management practices.
2. Get line management involved and create ownership.
3. Take action and maintain momentum.
4. Anchor strategic planning in customer needs and mission goals.
5. Measure the performance of key mission delivery processes.
6. Focus on process improvements in the context of an architecture.
7. Manage information systems projects as investments.
8. Integrate the planning, budgeting, and evaluation processes.
9. Establish customer/supplier relationships between line and information management professionals.
10. Position a Chief Information Officer as a senior management partner.
11. Upgrade skills and knowledge of line and information management professionals.

Assessment Results

The self assessment tool has six diagnostic areas with specific questions within each area. The steering committee members assessed ARS against these questions using the four-level rating system developed by GAO:

1 = unstructured, 2 = being defined, 3 = being implemented, 4 = institutionalized

Following are the mean assessment scores for each of the questions in the 6 diagnostic areas:

Diagnostic Area 1: The Importance of Information Management to the Agency Mission

Mean

2.10 Agency officials regularly assess their mission performance and identify potential contributions of IRM
1.90 Line managers are held accountable for achieving program results through the use of IRM.
1.70 Agency executives balance short-term and long-term approaches to improving IRM performance.

Diagnostic Area 2: Strategic Planning, Budget, and Evaluation Integration

Mean

3.00 Agency officials (a) identify and periodically reassess needs and priorities of customer groups, (b) incorporate needs into plans and goals, and (c) match products and services to customer groups.

2.10 Strategic planning, budgeting, and evaluation processes are (a) fully integrated, and (b) used to make key program improvement and IT investment decisions.

Diagnostic Area 3: Measure the Performance of Key Mission Delivery Processes

Mean

2.56 Managers use performance data in key management processes. They use baselines and benchmarks as tools for developing improvement goals.

2.44 The agency consistently uses a mix of outcome and efficiency performance measures to assess the impact of information management activities on mission delivery and productivity.

Diagnostic Area 4: Focus on Process Improvement in the Context of an Architecture

Mean

2.50 Improvement projects are customer-oriented and focused on core business processes.

2.30 The agency engages in process improvement efforts to create order-of-magnitude improvements.

2.20 The agency uses information and IT architectures to support its process improvement.

Diagnostic Area 5: Manage Information and Information Technology Projects as Investments

Mean

1.30 The agency uses an investment review board (IRB) led by executive managers to make key investment decisions.

1.30 The IRB uses a disciplined process to select and manage projects.

1.30 The IRB manages the proportions of expenditure on maintenance and strategic investments.

Diagnostic Area 6: Build Organization-Wide Capabilities To Address Mission Needs

Mean

2.50 Line managers identify information needs, while IRM professionals supply information products and services
2.00 The agency has a professional development program for line and information resource managers.
1.33 A CIO is placed as an executive management partner.

Recommended Actions

Based on this assessment, the ITM Steering Committee recommended establishment of three action teams to:

1. Revise the current Information Strategy Plan with an ARS focus

    - Reinstate the information engineering effort
    - Focus on ARS, not REE
    - Include program support and program management

2. Establish an Information Technology Review Board

    - Capital planning and investment control
    - Systematic review of information technology projects
    - Integration of information technology investment into overall agency management

3. Institutionalize top management support for information technology

    - Stability across changing leadership
    - Strategy for communication and elimination of barriers
    - Develop overall policy and guiding principles

The Administrator agreed to these recommendations and since then, three additional teams have been established:

4. Redesign Program and Resource Management Processes and Systems
5. Develop an Information/Communication Strategy for National Programs
6. Research Information Needs

Attachment L

Action Team Charters

Team #1: **Revision of the REE Information Strategy Plan**. This team, chaired by Will Blackburn, Area Director, NPA, was charged with revising and updating the 1995 REE Information Strategy Plan. The 1995 plan addressed administrative system needs for the entire REE mission area. The team's guidance for this revised plan was that it should focus only on the Agricultural Research Service, but that it needed to go beyond the 1995 plan and address all ARS functions including program operations.

Team #2: **Establish an ARS Information Technology Investment Review Board.** This team was chaired initially by George Foster, Acting Associate Area Director, SPA, until his retirement in July 1998 when he was replaced by Chris Johnson, Computer Systems Analyst, Information Technology Division, AFM. This team was charged with developing a charter and proposed membership for an Information Technology Investment Review Board for ARS. Such a board was recommended by the Clinger-Cohen Act and required by the USDA Chief Information Officer.

Team #3: **Strengthen Management Involvement in Information Technology**. This team, chaired by Anna Hewings, Associate Area Director, MWA, was charged with developing a strategy to increase involvement of agency managers in IT decisionmaking in support of the Information Technology Investment Review Board.

Team #4: Redesign of Program and Resource Management Processes and Systems. This team was co-chaired by Dave Rust, Program Planning Advisor, NPS, and Ric Dunkle, Area Director, MWA, with project management and facilitation from Jennifer Clouse, Computer Systems Analyst, ITD/AFM. The purpose of this team was to reengineer agencywide resource and program planning and management processes. The results of this reengineering effort would then be used to develop integrated planning and management systems for ARS.

Team #5: Develop an Information/Communication Strategy for National Programs. This team was chaired by Claudia Weston, Chief, Information Management Branch, NAL. It was charged with developing an overall strategy for communicating ARS national programs to customers, stakeholders, and ARS staff and for integrating the related program elements using electronic technologies. The results of this effort would be used to implement an integrated communication process that would make information related to ARS research activities more accessible.

Team #6: Research Information Needs. This team, chaired by Richard Soper, Associate Area Director, SAA, was charged with determining how best to meet the information needs of ARS researchers at a reasonable cost. The team was expected to identify information needs, explore options and costs of electronic resources, and recommend an appropriate system or service.

Attachment M

Participants

Information Technology Management Steering Committee

Edward B. Knipling, OA, Co-chair
Pamela Q.J. André, NAL, Co-chair
Will Blackburn, NPA
Ruth Coy, IS
Steve Edney, SAA
George Foster, SPA
Wiz Horner, AFM
Peter Johnsen, MWA
Jean Steiner, SAA
Tom Walton, MWA
Support to ITMSC:
Keith Anderson, AFM
Marva Nesbit, OA

Team 1: **Revision of the REE Information Strategy Plan**

Will Blackburn, NPA, Chair
Dick Amerman, NPS
Steve Edney, SAA
Robyn Frank, NAL
Chris Johnson, AFM
Al Kemezys, AFM
Leonard Lane, PWA
Ray Leaman, AFM
Jim DeQuattro, IS
Mike Shannon, PWA

Team 2: **Establish an ARS Information Technology Investment Review Board**

Chris Johnson, AFM, Chair
George Foster, SPA
Darrell Cole, BA
Ruth Coy, IS
Gary McCone, NAL
Carol Shelton, AFM

Team 3: **Strengthen Management Involvement in Information Technology**

Adrianna Hewings, MWA, Chair
John Crew, NAA
Bruce Kinzel, OTT
Chuck Onstad, SPA
Maria Pisa, NAL
Gail Poulos, OTT

Team 4: Redesign of Program and Resource Management Processes and Systems

Ric Dunkle, MWA, Co-chair
Dave Rust, NPS, Co-chair
Jennifer Clouse, AFM, Project Leader
Pat Bothast, MWA
Al Dedrick, NPS
Dell Delfosse, NPS
Steve Helmrich, AFM
Pete Lombardo, NPS
Bill Marmer, NAA
Wilda Martinez, NAA
Pamela Mason, NPS
Kathy Michels, BPMS
Jan Overton, MWA
Debbie Perry, SAA
John Radin, NPS
Scott Rieland, NPS
Jim Rogers, NAA
Tonja Socks, NPS
Morse Solomon, BA
Jean Steiner, SAA
Curtis Wilburn, AFM
Dave Young, AFM
Facilitation and Support:
Connie Cronin, AFM
Erwin Miller, AFM
Jeanne Rector, AFM

Team 5: Develop an Information/Communication Strategy for National Programs

Claudia Weston, NAL, Chair
Ray Carruthers, PWA
Sandy Hays, IS
Bruce Kinzel, OTT
Pamela Mason, NPS
Lee Panella, NPA
Gail Poulos, OTT
Dave Rust, NPS

Team 6: Research Information Needs

Dick Soper, SAA, Chair
Keith Anderson, AFM
Andy Hammond, SAA
Stuart Hardegree, PWA
Steve Helmrich, AFM
Ed King, MSA
Laura McConnell, BA
Bob Silva, MWA
Claudia Weston, NAL